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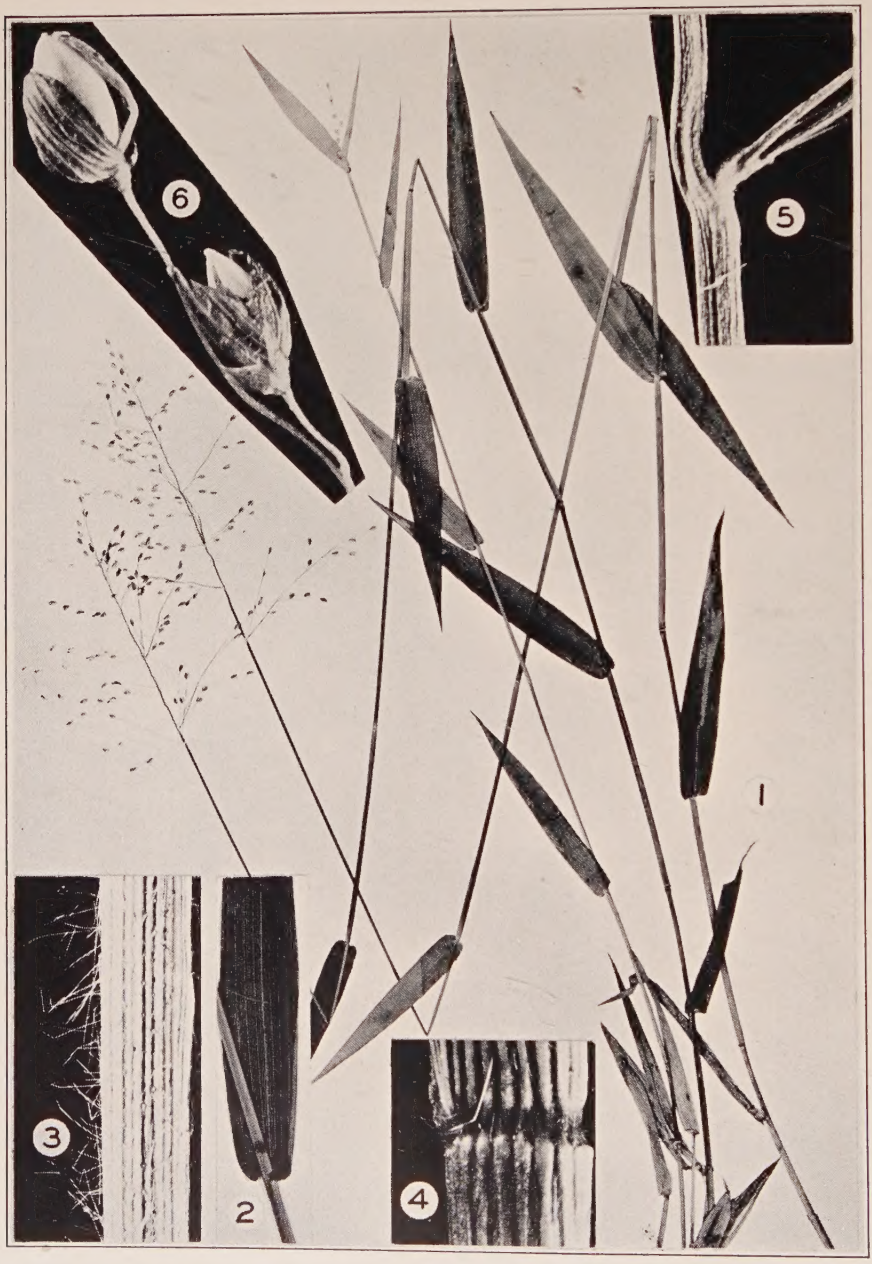

Photo. H. G. Fernald.

PANICUM RECOGNITUM: FIG. 1, TYPE, × ½; FIG. 2, base of cauline leaf, × 1; FIG. 3, pubescence of sheath, × 10; FIG. 4, node, × 10; FIG. 5, pulvinus and base of panicle-branch, × 10; FIG. 6, spikelets, × 10.

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CAREX FOENEA, C. STRAMINEA AND C. ALBICANS IN WILLDENOW'S HERBARIUM

H. K. Svenson

The exact identity of these three American species of *Carex* has always been somewhat confusing, and the temptation to examine the actual types could not be resisted when, through the kindness of Dr. Diels and Dr. Pilger, it was my privilege during the past summer to examine the Cyperaceae in the Willdenow Herbarium at the Royal Botanic Garden in Berlin. Since the results of this examination contradict the generally accepted interpretations of these species, I am providing somewhat detailed notes on the specimens.

Carex foenea Willd. It is obvious that Willdenow's brief diagnosis was based on the single sheet (no. 17167) in the Willdenow Herbarium. Unfortunately the type collection is without rootstocks, but each of the three fruiting culms bears 3 to 5 leaves which are 3 mm. wide, and has an inflorescence (approximately 2 cm. long) composed of aggregated spikes. The acute hyaline scales with greenish midrib are equalled by the perigynia. The perigynia are mature and measure 5 mm. long by 1.5 mm. wide, with the outer face showing four prominent nerves over the distended achene and similar nervation on the inner face, the most striking feature being the long smooth to slightly-serrulate beak, which rises abruptly from the narrowly winged body of the perigynium. Therefore, the type of *C. foenea* is not the plant with moniliform inflorescence with which the name has been associated, but the species long known as *C. siccata* Dewey. The only other possible disposal of this material, grown at an early date at the Berlin Botanic Garden, would be to treat it as a short-

headed and aberrant *C. bromoides*, an interpretation which under the circumstances would not be plausible.

It may be noted that Dewey's diagnosis of *C. siccata*,[1] a plant originally described from Westfield, Massachusetts, is closely similar to that of *C. foenea*, and both are included here for comparison.

C. SICCATA Dewey. "Spica composita, distigmatica; spicula terminali androgyna, superne staminifera obtusa; spiculis inferis subquaternis staminiferis ovatis acutiusculis, infime saepa inferne fructifera cum bractea squamosa oblongo-lanceolata, omnibus ovatis acutiusculis approximatis; fructibus ovato-lanceolatis acuminatis compressis margine scabris bifidis nervosis, squamam ovato-lanceolatam subaequantibus.

CAREX FOENEA Willd.[2] "C. spica androgyna composita, spiculis subquaternis, inferne masculis, approximatis, fructibus ovatis acuminatis marginatis bidentatis, squamam oblongo-lanceolatam subaequantibus. *Habitat in* America *boreali*. Carici stramineae et festucaceae proxima."

Dewey recognized the exceedingly close relationship of *C. siccata* to *C. intermedia* Good. (*C. disticha* Hudson) of northern Europe; his illustration (l. c., t. F. fig. 18) was poor and misleading, which he himself probably realized in admitting that "The figure of our plant does not show the usual number of spikelets." But how could the identity of *Carex foenea* have remained so in obscurity? *Carex* in eastern America has been studied from early times by botanists of experience and judgment—Schweinitz, Dewey, Torrey, Tuckerman, Boott—not to mention those of the present day. In the beginning, Willdenow (1809) described aberrant, soft, short-headed specimens from cultivated material, lacking entirely the characteristic rootstocks. He allied his new species (*C. foenea*) with *Carex straminea* and *C. festucacea*, probably without clear impression of the identity, to say the least, of *C. straminea* (see discussion under that species). Willdenow's correspondent, Muhlenberg, also had specimens of "*C. foenea*" and upon these Torrey and Schweinitz[3] based their conception of *Carex foenea*, and described the species as follows:

"CAREX FOENEA, Muhlenberg. C. spiculis pluribus (8–10,) compositis, inferioribus distinctis, superioribus confluentibus; fructibus ovatis, acuminatis, alatis, bidentatis, glumis ovatis paulo longioribus. Obs. This species is nearly related to *C. lagopodioides* [*C. tribuloides* Wahl.]."

Continuing this interpretation, Torrey[4] treated *C. foenea* as a marsh plant with subglobose spikelets, and to him it represented the coastal

[1] Am. Jour. Sc. x. 278 (1826).
[2] Enum. Pl. 957 (1809).
[3] Ann. Lyc. N. Y. i. 315 (1825).
[4] Compend. Fl. Northern & Middle States, 338 (1826).

plain species until recently known as *C. albolutescens* Schweinitz. It is true that Torrey did actually seek out the identity of Willdenow's specimen, but he got from Schlechtendal[1] only the worse than useless notation: "*C. foenea* n. 17,167.—Specimina hortensia Tuis flaccidior sed nullo alio modo diversa." [The garden specimens are softer than yours but in no other way different].

The unknown character of *Carex straminea* now intruded into the foreground, with Torrey, as well as other botanists of his period, trying to reconcile Schkuhr's two diverse figures of that species. Torrey, in his monograph of North American Cyperaceae,[2] believing with reason that *C. foenea* was a member of the *Ovales*, forthwith placed it as a variety under *C. straminea* and there it remained. Even Kunth, the outstanding master of the Cyperaceae, followed Willdenow, Torrey and Dewey in placing *C. foenea* in the *Ovales*, and thought it only a garden form of *C. scoparia*.[3] But Kunth did provide an excellent description of the type specimen, which might well have been given closer attention by subsequent botanists. The complete state of confusion in this group of *Carex* was well recognized by Tuckerman[4] who, including *C. foenea* and several species of *Ovales* under *C. straminea*, noted that if *Carex foenea* was a poor species, *Carex festucacea* appeared to be even worse.

The question naturally arises as to why Willdenow allied *C. foenea* with the *Ovales*. The answer, I believe, is that the position of staminate flowers in *C. foenea* (*C. siccata* Dewey) is extremely variable. The middle staminate spikes of the densely aggregated inflorescence could easily be taken for bases of androgynous spikes and I have, moreover, found pistillate spikes in *C. siccata* bearing a few stamens at the base. Willedenow's somewhat aberrant specimens of *C. foenea* were very mature, a situation which would not help any decision as to the actual location of stamens.

At a time when *C. foenea* was being treated as a member of the *Ovales* by all competent American botanists, L. H. Bailey examined the type in the Willdenow Herbarium[5] and identified *C. foenea* with Tuckerman's *C. argyrantha*, described by Dewey in 1860. DeCandolle states in his "Phytographie" (p. 18) that some of Schkuhr's

[1] Linnaea, x. 261 (1836).
[2] Ann. Lyc. N. Y. iii. 395 (1836).
[3] Enum. Pl. ii. 398 (1837).
[4] Enum. Caricum, 18 (1843).
[5] Mem. Torr. Bot. Club. i. 3 (1889).

Carices are at Halle. However, the herbarium at Halle was examined by Bailey (l. c.), who makes the following illuminating comment on Willdenow's collection at Berlin: "This herbarium contains most of the types of Muhlenberg and Schkuhr. The specimens were probably furnished entirely by Muhlenberg to Willdenow, and by Willdenow lent to Schkuhr. It appears from comparisons of Willdenow's specimens with Schkuhr's plates, that most if not all of the specimens from which the drawings were made, were returned to Willdenow. Duplicates were retained by Schkuhr." And further (p. 26): "The species [*C. foenea*] as I have drawn it, includes larger forms than those described either by Willdenow or Tuckerman. Willdenow's specimens, particularly, are weak and short-headed, but as they were from cultivated plants they cannot be regarded as wholly representative of the species. The specimens of *C. foenea* in Willdenow's herbarium are immature, but the characters are evident. Moreover, among the specimens of *C. ovalis*, in Willdenow's collection, is a sheet of the same, the specimens being more developed. This sheet is evidently from the same plant as the original; in fact, in the general herbarium at Berlin this plant is again mixed with '*C. ovalis*', and as *C. ovalis* was cultivated in the gardens at that time (*vide* Enum. Pl. Hort. Berol.), it is apparent that the original *C. foenea* was mixed with it in culture. It is evident, therefore, that the specimens lying with *C. ovalis*, both in Willdenow's herbarium and in the general collection, are duplicates of the type. These duplicates are important, for they are mostly mature, although they differ in no other respect from Willdenow's type specimens." It is thus easy to see how Willdenow's no. 17167, supposed to be an immature cultivated specimen of a species belonging to the *Ovales*, could be readily passed over for the selection of a more satisfactory type.

Carex siccata Dewey (and of recent authors) must now be treated as a synonym of *C. foenea* Willd. For the plant with moniliform inflorescence passing as *C. foenea* the correct name appears to be *C. argyrantha* Tuckerm. Although typified by slender plants (such as Olney's distribution from the type station at Hadley, Massachusetts), *C. argyrantha* passes to coarse plants, occasionally with compound spikes (cf. Boott, t. 381), such as are often found on newly-constructed roadbanks and in other localities where conditions are favorable for growth. This robust form, known as *C. foenea* var. *perplexa* Bailey (cf. Robinson & Fernald in Gray, Man. ed. 7, fig. 367 (1908)), has

strongly ribbed perigynia a trifle larger, but otherwise identical, with those of Olney's distribution.

CAREX STRAMINEA. Two sheets (no. 17177) are represented in Willdenow's herbarium but only the first, labeled "Klaproth" "Am. Bor.," conforms to the diagnosis on the species cover: "Carex straminea spiculis androgyneis ovatis distantibus et inferne masculis capsulis acuminatis hispidis" and to Willdenow's own description.[1] This fragmentary specimen, consisting only of the upper part of a culm, bears a flexuous inflorescence (4 cm. long) of five somewhat distant spikes, the uppermost of which is 10 mm. long, including the strongly clavate base. Those perigynia which have not fallen project beyond the subulate glistening-brown (almost coppery) scales, both perigynia and scales contributing to the echinate appearance of the inflorescence. The broadly obovate golden-brown perigynia (4.5 mm. long and 2.5 mm. wide) are strongly winged, with 10 to 12 distinct nerves on each face, and the margin of the beak is finely and irregularly toothed. These characteristics seem to delineate the plant as *Carex Richii* and nothing else.[2]

Bailey,[3] having described the perigynia of *C. straminea* as "small and comparatively narrow, often long-pointed," notes that this weak plant was the species "originally described and figured by Schkuhr." Consequently, when Fernald (RHODORA viii. 165 (1906)) saw the actual type of *C. tenera* in Dewey's herbarium, he recognized it as the small representative of *C. straminea* which had been considered as typical by Boott and presumably by Bailey, and applied the new name *Carex hormathodes* to the larger plant of the coastal marshes. From *C. hormathodes* the var. *Richii* has been segregated as a distinct species, and as such was typified by Mackenzie.[4] In Boott's illustration of *C. straminea* var. *aperta*,[5] the inflorescence to the right is exceedingly close to Willdenow's type of *C. straminea*, and so is the achene which he has illustrated in full. Schkuhr's illustration,[6] except for the stamens which were probably included on general principles, is a moderately good representation, though conventionalized and slightly reduced, of Klaproth's specimen.

[1] Sp. Pl. iv. 242 (1805).
[2] Professor Fernald concurs with me in this interpretation.
[3] Mem. Torrey Club, i. 22 (1889).
[4] N. Am. Fl. xviii. 160 (1931).
[5] Ill. Carex, t. 385 (1862).
[6] Riedgr. t. G. fig. 34 (1801).

The second sheet of *Carex straminea* in Willdenow's herbarium bears the annotation "Carex 43 Muhl. W.," and "Muhlenberg misit." It consists merely of a non-flexuous inflorescence of six greenish, nearly approximate spikes. The surface of the immature ovate perigynia (3.0 x 1.5 mm.) shows no satisfactorily definite veining, but is rather prominently reticulate. The narrow, acute, rigid scales are shorter than the perigynium, the beak of which is irregularly but strongly serrulate, with a tubular (i. e. not strongly bidentate) opening. In my opinion this specimen is *Carex normalis* Mack. (*C. mirabilis* Dewey). It has no value in fixing the type of *C. straminea*, but has contributed to the inordinate confusion which surrounds the species. Sketches of the type of *C. straminea* which I have seen at the Gray Herbarium are of this Muhlenberg specimen.

At a comparatively early date, Bailey[1] had revived the original name, *C. albolutescens* Schweinitz, for *Carex straminea* var. *foenea* Torr. Later, Mackenzie (Bull. Torrey Club, xlii. 605 (1915)), emphasizing the *obovate* character of the perigynium as described by Schkuhr, saw the "real" *Carex straminea* as a distinct plant having a strong resemblance to *C. alata*, with stiff inflorescence, perigynia 5–7-nerved ventrally, and greenish scales, and in 1922,[2] the conclusion was reached by Mackenzie that Schweinitz's type of *C. albolutescens* was the "real" *C. straminea*. Accordingly *C. albolutescens* was relegated to synonymy and the old "*C. albolutescens*" became *C. Longii* Mack. The identity of the type of *C. straminea* having now been cleared up, the name *Carex albolutescens* can happily be restored, and that of *Carex Longii*, if actually distinct from *C. albolutescens*, can be likewise maintained.

C. albicans Willd. ex Sprengel.[3] The specimen was briefly described as follows: "C. spicis ♀ subternis lanceolatis erectis approximatis, fructibus lanceolatis squamam nitide albam aequantibus. *Carolina.*" The type in the Willdenow Herbarium (no. 17259) from "Carolina boreali," said by Schlechtendal (Linnaea, x. 264 (1836)) to have come from Desfontaines, is a poor juvenile specimen resembling *C. varia*, but characterized by short, narrow, and exceedingly rigid leaves. It seems impossible to determine what this wretched little plant may be, denounced by Kunth[4] with the words: "Fieri potest, ut

[1] Bull. Torrey Club, xx. 421 (1893).
[2] Bull. Torrey Club, xlix. 373 (1922) and also in N. Am. Fl. xviii. 162 (note) (1931).
[3] Syst. iii. 818 (1826).
[4] Enum. ii. 474 (1837).

species secundum talia specimina instituatur." [Is it possible that a species could be based on such specimens?]. *C. albicans*, possibly representing a very aberrant *C. nigro-marginata*, does not closely resemble any other specimen which I have seen. It is definitely not the plant now called *C. Peckii*, nor the coastal representative of *C. varia* with soft leaves and short staminate spikes, treated as *C. albicans* by Mackenzie.[1] It would seem best to drop the name entirely.

Brooklyn Botanic Garden.

CONTRIBUTION FROM THE GRAY HERBARIUM OF HARVARD UNIVERSITY—NO. CXXII

(*Concluded*)

VIII. NEW SPECIES, VARIETIES AND TRANSFERS

M. L. Fernald

(Plates 497–507)

Recent studies of plants of various groups in eastern North America have necessitated the changes of some names and combinations and the description of several heretofore unrecognized spermatophytes. The illustration of many of the latter has been made possible through grants for research from the Division of Biology of Harvard University and through the photographic skill of Dr. E. C. Ogden or of my son, Henry G. Fernald.

Eragrostis trichodes (Nutt.) Nash., var. **pilifera** (Scheele), comb. nov. *E. pilifera* Scheele in Linnaea, xxii. 344 (1849).

Panicum (sub-§Scoparia) **recognitum**, sp. nov. (tab. 497, 498), planta cespitosa 0.6–1.5 m. alta; culmis firmis basi 2–3 mm. diametro, internodiis elongatis 6 vel 7, glabris; nodis plerumque glabris vel glabratis; foliis rosulatis basilaribus lanceolatis firmis glabris 3–3.5 cm. longis 5–9 mm. latis 40–54-nerviis; foliis caulinis primariis 5–7 lanceolatis firmis glabris acuminatis 0.6–1.3 dm. longis 0.8–1.5 cm. latis basi cordatis ciliatis, vaginis horizontaliter hirsutis vel glabratis pilis basi bullatis, ligulis obsoletis; paniculis primariis deinde exsertis ovoideis vel ellipsoideis 0.8–1.3 dm. longis 6–10 cm. diametro, rhachi glabro, ramibus patento-adscendentibus minute barbellatis, pulvinis pubescentibus, pedicellis elongatis barbellulatis; spiculis pubescentibus ellipsoideis basi apiceque obtusis 2.2–2.8 mm. longis 1.2 mm. latis,

[1] N. Am. Fl. xviii. 190 (1935).

gluma inferiore deltoideo-ovata acuta 0.8–1 mm. longa, superiore lemmateque sterile aequilongis valde costatis fructus lucidos subaequantibus; statu autumnali sparse ramoso, ramibus elongatis adscendentibus, paniculis terminalibus 1.5–5 cm. longis.—Southern New Jersey and southeastern Pennsylvania. New Jersey: Camden County: headwaters of branch of Timber Creek, Albion, September 7, 1910, *Bayard Long*, nos. 4944, 4946, June 27, 1912, *Long*, nos. 7671 (type in Gray Herb., isotype in Herb. Phil. Acad.), 7672, 7676, July 9, 1912, *Long*, nos. 7790, 7792, 7794; head of Beaver Brook, Lawnside, June 12, 1916, *Long*, no. 15,030; northwest tributary of Cooper Creek, Ashland, June 29, 1918, *Long*, no. 19,315. Ocean County: open sandy and grassy area, Waretown, July 10, 1915, *Long*, no. 13,006. Cape May County: swamp north of New England Creek, July 6, 1912, *O. H. Brown*, no. 59. Pennsylvania: Kennett Square, Chester County, July 4, 1903, *W. Stone*, no. 5305; Lancaster County, July 9, 1904, *J. J. Carter*.

Panicum recognitum, for many years set apart in the herbarium of the Philadelphia Botanical Club as a strange species, was called to my attention by Mr. Long at the time we discovered *P. mundum* Fernald in Rhodora, xxxviii. 292, t. 443, figs. 1–5 (1936). Mr. Long has sent me for study a very full series, showing the plant in all stages of development. Its relationship is apparently with *P. mundum* and with *P. scabriusculum* Ell., both of which have, in well developed plants, more numerous primary leaves, these less cordate at base and with short but definite ligules. From *P. scabriusculum*, furthermore, *P. recognitum* is at once distinguished by shorter primary leaves, elongate autumnal branches with exserted panicles, copiously barbellulate panicle-branches with hairy pulvini, obtuse pubescent spikelets, elongate 1st glume and long grain. In fact, it cannot be confused with *P. scabriusculum*, although it is likely to be traced to that species in current keys. From *P. mundum*, which has similar branching and panicles, the latter with hairy pulvini, and the blunt spikelets pubescent, it is at once separated by its more cordate leaf-blade, the widely spreading pubescence of the sheaths, the glabrous culms and mostly glabrous or glabrate nodes, the barbellulate pedicels, the more ellipsoid and longer spikelet and longer 1st glume.

Superficially *Panicum recognitum* might suggest *P. boreale* Nash, but only very superficially. The more slender and much lower *P. boreale* has fewer and glabrous-sheathed thinner leaves, panicle-branches flexuous, spikelets more obovoid and only 2–2.2 mm. long, with short 1st glume. Specimens sometimes of a single collection,

Photo. H. G. Fernald.

PANICUM RECOGNITUM: plant showing autumnal branching, × ½.

Photo. H. G. Fernald.

ASARUM CANADENSE, forma PHELPSIAE: TYPE, × 1.

have been placed by different students under such very different species as *P. sphaerocarpum*, *P. Clutei* and *P. clandestinum*, such contradictory identifications clearly indicating the difficulty met in properly placing *P. recognitum* by existing keys.

Altogether, *Panicum recognitum* seems to be another of the highly localized species of sub-§*Scoparia*, comparable in its extreme localization with *P. aculeatum* Hitchc. & Chase, *P. cryptanthum* Ashe and *P. mundum*. If it were common over southern New Jersey and adjacent Pennsylvania the acute field-botanists who are there raking every spot would have so found it.

Asarum canadense L., forma **Phelpsiae**, forma nov. (tab. 499), foliis suborbicularibus vel rotundato-ovatis apice late rotundatis basi rotundatis sinu clauso.—New York: on limestone ledges, Gouverneur, September 4, 1915, *Orra Parker Phelps*, no. 1143 (type in Gray Herb.).

Mrs. Phelps states that this remarkable plant grows with typical *A. canadense* at Gouverneur; also at a similar station in De Kalb; both in St. Lawrence County. Plate 499 shows a portion of the type, × 1.

Drosera intermedia Hayne, forma **corymbosa** (DC.), comb. nov. *D. intermedia*, β. *corymbosa* DC. Prodr. i. 318 (1824). Subvar. *corymbosa* (DC.) Rouy. Fl. de France, iv. 5 (1897).

Agrimonia striata Michx., var. **campanulata**, var. nov. (tab. 500, fig. 1 et 2), foliolis ellipticis obtusis vel obtuse subacuminatis; hypanthio maturo campanulato basi rotundato 3–4 mm. longo 4–5 mm. lato, leviter costato.—Southwestern Colorado, New Mexico, Arizona and Mexico. The following are characteristic. Colorado: moist north slope, alt. 7000 ft., Norwood Hill, San Miguel Co., August 17, 1912, *E. P. Walker*, no. 480. New Mexico: Magollon Mts., Socorro Co., alt. 7500 ft., July 23, 1909, *O. B. Metcalfe*, no. 312. Arizona: Ramsey Canon, Huachuca Mts., September 29, 1929, *Marcus E. Jones*, no. 24,920 (type in Gray Herb.); Upper Miller Canon, Huachuca Mts., August 14, 1909, *Goodding*, no. 405; Rincon Mts., September 20, 1909, alt. 7900 ft., *Blumer*, no. 3384; Barefoot Park, Chiricahua Mts., alt. 8000–8250 ft., September 9, 1907, *Blumer*, no. 1598; head of White River, White Mts., July 23, 1910, *Goodding*, no. 671. Mexico: in the Sierra Madre, near Colonia Garcia, Chihuahua, August 28, 1899, *Townsend & Barber*, no. 290; City of Mexico, Federal District, October 9, 1898, *Holway*, no. 3235.

These specimens were mostly distributed as *Agrimonia Brittoniana* Bickn. (synonymous with *A. striata* Michx.) or as *A. Brittoniana*

occidentalis Bicknell. They were, perhaps, what the late Eugene P. Bicknell had in mind when he first applied the name *A. Brittoniana occidentalis* in the herbarium. But that name has no clear status. It was published as a *nomen nudum* for any *Agrimonia* occurring "from S. D. and Wyo. to N. M. and Ariz.," by Rydberg in his Flora of Colorado (Agr. Expt. Sta. Col. Agr. Coll., Bull. 100), 189 (1906). It had absolutely no descriptive word and the name, consequently, has no status. Even Rydberg himself, in his treatment of *Agrimonia* in the North American Flora, xxii[5]. 391–396 (1913) failed to mention it, but he mistook extreme plants of *A. striata*, var. *campanulata* for the northeastern and Californian *A. gryposepala* Wallr. He so identified Holway's material from Mexico City and he doubtless included the extreme New Mexican plants with it, giving the range for *A. gryposepala* "Nova Scotia to North Carolina, Nebraska, and North Dakota; apparently also California, New Mexico and Mexico" (l. c. 292). Except for the series from the Pacific slope (southern British Columbia to California), there is no indication in the Gray Herbarium of *A. gryposepala* from west and southwest of eastern Nebraska and Missouri.

Var. *campanulata* differs from typical transcontinental *Agrimonia striata* in its thinner and blunter leaflets (those of typical *A. striata* being usually firm, more or less canescent beneath, with long-acuminate to acute tips) and its round-based and broad fruiting hypanthium (FIG. 2); the ripe hypanthium in typical *A. striata* (FIG. 3) being cuneately turbinate, 3–4.5 mm. broad at summit and very deeply furrowed, whence the name. It occurs from Newfoundland to British Columbia and southward, in the West following the Rocky Mountains in typical form to Wyoming, with specimens clearly transitional to var. *campanulata* from as far south as New Mexico and Arizona.

POLYGALA VERTICILLATA L., var. **isocycla**, var. nov. (TAB. 501, FIG. 2 et 3), planta 0.5–2 dm. alta, plerumque ramosa, ramibus divergentibus vel oblique adscendentibus; foliis lanceolatis vel lanceolato-linearibus submembranaceis plerumque verticillatis, verticillis 3–7-foliatis; pedunculis 0.5–4 cm. longis; racemis densis lanceolato-cylindricis vel lanceolato-conicis apice attenuatis, parte florifero 0.5–1.2 cm. longo, viridiscentibus vel albidis; pedicellis 0.1–0.3 mm. longis; capsulis 1–1.6 mm. longis. *P. verticillata* sensu Pennell in Bartonia, no. 13: 9, pl. 2 (1932), not L., as to TYPE.—Dry or moist sterile open habitats, Massachusetts to southern Manitoba, south to

Florida, Alabama, Louisiana and Texas. TYPE: sandy field, Frazer, Chester Co., Pennsylvania, August 7, 1910, *E. B. Bartram*, no. 1124 (in Gray Herb.).

As noted, var. *isocycla* is the extreme of the polymorphous *Polygala verticillata* which Pennell treats as typical *P. verticillata* L. Sp. Pl. 706 (1753); whereas the plant (our FIG. 1) which Linnaeus indubitably had before him in preparing his own original *new* diagnoses in Species Plantarum, 706 (1753), which he personally marked "*verticillata*," and which in its technical details clearly matches his exact new diagnoses, is the ascending-branched and mostly taller plant with fewer and narrower leaves (3–5) in a whorl, the upper and frequently all but the lowest mostly scattered, the peduncles commonly long, the white to purplish racemes rather lax, the floriferous portion (after falling of basal fruits) 1–2 cm. long, the pedicels 0.5–2 mm. long, the seeds with slightly longer pubescence. The latter, which is the plant accurately described by Linnaeus from the material in his own herbarium, is *P. Pretzii* Pennell, l. c. 12, pl. 3, fig. 1 (1932).

Our nomenclature, most fortunately, does not reach back of 1753, and the typification of names obviously should stop there, except in those cases where Linnaeus based his species and other groups *solely* on specimens and diagnoses of earlier date. Whenever in 1753 Linnaeus had before him and clearly designated in his own herbarium a recognizable specimen and when he gave an original diagnosis which closely matches it, the references to earlier works should be treated as of minor importance if our taxonomy and nomenclature are to rest on the most secure bases possible. Otherwise, if the less clear and often quite confused writings prior to 1753 are given preference, we enter needlessly debatable and always unsatisfactory ground and taxonomy and nomenclature become unnecessarily obscure at points where they should be perfectly clear. The older diagnoses quoted by Linnaeus, as Dr. Pennell definitely shows, pertained to different entities, which he recognizes as species but which Gray, Blake (N. Am. Fl.) and most others have considered merely varieties of one variable species; and Dr. Pennell learnedly discusses the possible applications of the earlier polynomials. As studies in ancient history such speculations may be interesting but the deductions from them are needless and, as experience shows, where they are merely deductions they are exceedingly liable to error and they are too often prejudicial to the result where Linnaeus in 1753 gave a new and original account of his species

based upon actual specimens before him; only the latter is then really important. Pennell recognized that the plant in the Linnaean herbarium has some significance, saying:

"But still a further complication is introduced by the fact that by 1753 Linné had acquired for his herbarium the single specimen placed by him under this name; this came from Kalm, who collected in Pennsylvania and northward, and it was the second species of the key, named above *P. pretzii*. A plea might be made that it should be accounted the basis of *Polygala verticillata*, but against this is the fact that Kalm's plants were received so late as often to have had little influence on Linné's decisions and especially the further fact that it does not so well fit the Linnean diagnosis as does the first species of our key; the latter shows more perfectly the verticillate phyllotaxis and much better the remote disposition of the racemes."[1]

In order to be quite clear as to Pennell's interpretation it is wise to copy from his key-characters and descriptions of his *P. verticillata* (our var. *isocycla*) and his *P. Pretzii* (*P. verticillata* of L. herb.) the phrases describing the features he discusses:

1. P. VERTICILLATA sensu Pennell. Raceme slender, *dense* and conic, the sepals greenish-white; leaves all in whorls of 3–7, only the uppermost occasionally opposite or scattered; plant "1–2" (or "1–3") dm. tall, with widely spreading branches and the racemes on peduncles 0.5–4 cm. long.

[1] Pennell's argument, that "Kalm's plants were received so late as often to have had little influence on Linné's decisions," is at least novel. It is also difficult to reconcile with the well known fact, that Kalm came to America at the instigation of his teacher, Linnaeus, who, on October 23, 1747, wrote to Adalbert von Haller; "Kalm is lately gone to England, from whence he will proceed to Canada, in order to collect seeds for the Upsal garden, as the plants of that country bear our winters perfectly well. He is a pupil of mine, and has just been appointed oeconomical professor at Abo, in consequence of my recommendation"—J. E. Smith, Sel. Corr. Linnaeus, ii. 417 (1821). In August, 1748, Linnaeus again expressed keen interest in Kalm's enterprise, writing to John Mitchell, "I hope his journey will be prosperous. I have rendered him every service in my power." (Smith, l. c. 446). In the winter of 1750–51 Kalm started home to Sweden and on February 1, Cadwallader Colden wrote to Linnaeus from his estate in New York of having sent to him by Kalm some notes on American plants (Smith, l. c. 457); and Kalm himself, during his American travels, had taken every opportunity to transmit detailed accounts of his discoveries, sent "*a Monsieur Charles Linnaeus Premier Medecin du Roy et Professeur en Medicine et Botanique d'Upsal*" or "*To The Secretaire of the Swedish Royal Society of Sciences in Upsal in Sweden, Master Charles Linnaeus.*" From Kalm, returned to Sweden, Linnaeus received detailed letters, written from Stockholm and sent to Upsala, beginning in May, 1751, and continuing for some years. These letters are full of details regarding "Pennsylvanien, Nya Yersey, Nya York och Nya England" and regarding the plants which Kalm had carried back to Sweden. (See especially J. M. Hulth, Bref och Skrifoelser af och till Carl von Linné, viii.[1] 1–118 (1922), these pages being the letters from Kalm to Linnaeus). Linnaeus had Kalm's collections at least two full years before the publication of *Species Plantarum*. Those who believe that he was not profoundly interested in them and that they "had little influence on Linné's decisions" have an original and difficult thesis to defend. If Kalm's material was of so little significance, it is singular that many species were based solely upon his plants.

2. P. Pretzii Pennell (*P. verticillata* L. herb.). Raceme *looser;* the sepals white or somewhat pinkish; leaves in whorls of 3–5, the upper or sometimes nearly all scattered; plant usually 2–3 dm. tall, with ascending branches and the racemes on peduncles 2–7 cm. long.

Pennell lays much stress on the more generally verticillate leaves of his no. 1, as meaning to him that Linnaeus really intended that plant with "dense" racemes of greenish-white flowers. He also feels that the plant which Linnaeus had in his own herbarium and ticketed "*verticillata*" (Pennell's no. 2), "does not so well fit the Linnean diagnosis as does the first species of our key; the latter shows more perfectly the verticillate phyllotaxis and much better the remote disposition of the racemes."

Linnaeus had two brand new or original (unquoted) diagnoses for his *P. verticillata*. The first was taken over largely from that of his pupil, Jonas Kiernander (1751), but with most significant differences. Kiernander's diagnosis had been: "POLYGALA floribus imberbibus spicatis, caule erecto herbaceo filiformi ramoso, foliis linearibus;[1] but in his own description, in 1753 (the first diagnosis which absolutely concerns us), Linnaeus added the facts that the leaves are *verticillate,* as they are in either 1 or 2 of Pennell, and the flowers *remote* in the spike ("spicis floribus remotis", which Pennell, most unfortunately, renders "the remote disposition of the racemes"). From his mistranslation of this diagnosis Pennell deduces that Linnaeus meant the plant with racemes "dense" and "conic," not the one with them "looser." The second and wholly new diagnosis of Linnaeus read "Folia *saepius quina ad genicula, interdum alterna.* Spicae *albae, angustissimae flosculis remotis,*" which, rendered into English, would be: "leaves frequently 5 to a node, sometimes alternate; spikes white, very slender, with the flowers remote." In view of the fact that Linnaeus had, two years before the publication of this new and clear diagnosis, received the American collections of his student Kalm, who had gone to America at Linnaeus's instigation, and had placed in his own herbarium a couple of Kalm's plants which he labeled "*verticillata*" (see our fig. 1), there should be no serious doubt that this material, accurately displaying the several points in the second and wholly new diagnosis of Linnaeus, should stand as the type of his *Polygala verticillata.* The arguments that by "Folia *saepius quina ad genicula, interdum alterna*" Linnaeus intended to say "Leaves all in

[1] Kiernander in L. Amoen. Acad. ii. 139 (1751).

whorls of 3 to 7, only the uppermost occasionally opposite or scattered" and that by his "Spicae *albae*, *angustissimae floseulis remotis*" he really meant "Racemes [spikes] dense" and "conic," with "greenish-white" sepals, are unconvincing.

Polygala verticillata, var. *isocycla* (FIGS. 2 and 3) might be considered inseparable from var. *sphenostachya* Pennell in Bartonia, no. 13: 12 (1932) (our FIG. 4). Treating as *P. verticillata* (typical) the plant I am calling var. *isocycla*, with "Capsule 0.9–1.2 mm. long," his var. *sphenostachya* was defined "Floribus et fructibus majoribus diversa," which in the key on the preceding page was clarified: "Capsule about 1.5 mm. long; plants usually 1.5–3 dm. tall." A fine sheet of isotypes (*Bush*, no. 7692) of var. *sphenostachya* is in the Gray Herbarium. Its capsules are not well developed, the racemes being relatively young, but the most mature capsules, when checked by a thin and finely divided metal measure show lengths of 2–2.3 mm. (FIG. 4). Dr. S. F. Blake writes me that the TYPE in the National Herbarium likewise "has fruits measuring 2–2.3 mm. long." Similarly, a considerable series, occurring in the Mississippi Basin and adjacent areas, shows capsules of like size. These plants with large capsules (much larger than originally defined) are var. *sphenostachya*, because of the cited type. Var. *isocycla* is more wide-ranging, and occurs on the Atlantic slope as well as westward. It is smaller in general than var. *sphenostachya* and its capsules (FIG. 3) are 1–1.6 mm. long, the largest ones reaching the measurements of the smallest in var. *sphenostachya*. Such transitional specimens are, naturally, difficult to pigeon-hole.

NYMPHOIDES **cordatum** (Ell.), comb. nov. *Villarsia cordata* Ell., Sk. Bot. S. C. and Ga. i. 230 (1816 or '17). *V. lacunosa* sensu Eaton Man. Bot. No. Mid. States, ed. 2, pt. 2: 492 (1818); sensu Torr. Fl. No. Mid. U. S. i. 215 (1824); sensu Bigel. Fl. Bost. ed. 2: 78 (1824); and later authors, not Ventenat, Choix des Plantes, 9 (1803). *Limnanthemum lacunosum*, α. Griseb. Gen. Sp. Gent. 47 (1839), as to plant described, not as to source of specific epithet. *N. lacunosum* Fernald in RHODORA, x. 54 (1908), as to plant, not as to source of specific epithet.

We have two native species of *Nymphoides:* one a small plant, ranging from Florida and Louisiana northward to southeastern Canada and Newfoundland, known in recent works as *N. lacunosum* or *Limnanthemum lacunosum;* the other much coarser, occurring from Florida to Texas, and northward on the coastal plain to Delaware and southern

Photo. H. G. Fernald.

AGRIMONIA STRIATA: FIG. 3, fruit, × 8.

A. STRIATA, var. CAMPANULATA: FIG. 1, plant, × ⅜, from Arizona; FIG. 2, fruit, × 8, from TYPE.

Photo. E. C. Ogden.

POLYGALA VERTICILLATA: FIG. 1, one of the 2 plants in Linnean Herbarium (TYPE), × 1, *courtesy of* Mr. Spencer Savage.

Var. ISOCYCLA: FIG. 2, TYPE, × 1; FIG. 3, raceme, × 4, from TYPE.

Var. SPHENOSTACHYA: FIG. 4, raceme, × 4, from ISOTYPE.

New Jersey, known, correctly, as *N. aquaticum* (Walt.) Ktze. The two are distinguished as follows:

N. CORDATUM (N. LACUNOSUM of recent authors). Floating leaves with filiform smooth petioles, the cordate-ovate blades 1.5–5 cm. broad, often mottled or variegated above, scarcely or only minutely pitted beneath; spur-roots frequent; calyx 3–5 mm. long; corolla 0.5–1 cm. broad; capsule ovoid-subglobose, 3–5 mm. long; seeds smooth.

N. AQUATICUM. Floating leaves with cord-like often purple-glandular petioles, the suborbicular to reniform thick blades 0.4–1.5 dm. broad, usually green above, abundantly and coarsely vesicular and pitted beneath; spur-roots less frequent; calyx 4–8 mm. long; corolla 1–2 cm. broad; capsule elongate, 6–9 mm. long; seeds glandular-roughened.

The first North American species defined was *Anonymos aquatica* Walt. Fl. Carol. 109 (1788), clearly described "foliis peltato-reniformibus, coriaceis, subtus punctatis," etc. It was also described as *Menyanthes trachysperma* Michx. Fl. Bor.-Am. i. 126 (1803): "M. habitu nymphoideo . . . seminibus vesiculis ovatulo-oblongis conspicue scabris." There is no question as to the plants of Walter and of Michaux; and Michaux cited *Villarsia aquatica* (Walt.) Gmel. as the same as his *Menyanthes trachysperma*, giving a new name descriptive of the characteristic seeds.

No distinction was noted by the northern botanists, Eaton, Torrey, Bigelow and others of their period, because they knew only the slender and small northern species; and when Grisebach treated the genus he created a confusion which every one has followed, although in 1912, in a foot-note, Dr. Witmer Stone[1] noted the error involved. Considering both our plants as constituting one species with two varieties, Grisebach, l. c., called the small plant *Limnanthemum lacunosum*, α., with the synonym, derived from an herbarium-name, *Menyanthes punctata* Muhl.; the larger plant, *L. lacunosum*, β. *australe*, "magnitudo decies major, lacunis quoque majoribus," with *Anonymos aquatica* Walt., *Villarsia aquatica* (Walt.) Gmel. and *Menyanthes trachysperma* Michx. cited as belonging to it. Most singularly, Grisebach cited *Villarsia lacunosa* Ventenat as belonging to his var. α., not to his var. β.; and Gray, Britton and most others have faithfully followed Grisebach's erroneous course as to the identity of *Villarsia lacunosa*. Furthermore, northern botanists, familiar with the lake- or pond-habitat of the small species, have forced the Latin name into signifying the habitat.

Ventenat, however, as pointed out by Stone, was simply giving to

[1] Stone, Pl. So. N. J. 644 (1912).

the large southern plant a new specific name, a substitute for those already given it; and the new and quite *illegitimate* name was in recognition of the superabundant pits (lacunae) in the lower leaf-surface! Here is Ventenat's treatment:

"Le genre Villarsia comprend les espèces suivantes:

. . . . . .

V. lacunosa (Anonymos *aquatica*, Walther, *Flor. Carolin.* Villarsia *aquatica* (2). Gmel. *Syst. Veget.* et Bosc, *Bullet. de la Soc. Philom.*) Foliis reniformibus, subpeltatis, subtus lacunosis, natantibus; petiolis floriferis; corollis glabris."[1]

That *Villarsia lacunosa* Vent. was merely the coarse southern plant is sufficiently evident. Surely the name did not apply to the slender and usually more northern species nor can it be used for any species, being merely a substitute or illegitimate name.

Stephen Elliott clearly understood the two plants. The coarse southern species he called *Villarsia trachysperma*, based on *Menyanthes trachysperma* Michx., with Walter's *Anonymos aquatica* as a synonym, and described: "*Leaves* . . . frequently orbicular, 3–4 inches in diameter, . . . underneath . . . covered with vesicular points. *Petioles* . . . dotted, sometimes roughened . . . Flowers June."[2] The slender plant was beautifully described by him as *Villarsia*

"1. Cordata. E.

V. foliis cordatis, integerrimis; petiolis floriferis. E.	Leaves cordate, very entire; petioles bearing the flowers.

Grows in shallow streams. *Petioles* . . . slender, glabrous. *Leaves* about an inch long, exactly cordate, variegated. . . . . Flowers July–September."

A fragment of Elliott's type, long ago secured by Asa Gray, is wholly characteristic.

Treating the small-leaved and slender plant as *Limnanthemum lacunosum* (following Grisebach), Gray gave in the synonymy in the Synoptical Flora Elliott's name, saying "V[*illarsia*] *cordata*, Ell. Sk. i. 230, a fitter name." Not only is it "a fitter name"; so far as I have found, it is the only name that fits.

Halenia deflexa (Sm.) Griseb., forma **heterantha** (Griseb.), comb. nov. *H. heterantha* Griseb. Gen. Sp. Gent. 325 (1839). *H. deflexa*, var. *heterantha* (Griseb.) Fern. in Rhodora, i. 37 (1899).

[1] Vent. Choix des Plantes, 9 (1803).
[2] Ell. Sk. Bot. S. C. and Ga. i. 230 (1816 or '17).

Although spurless flowers frequently occur late in the season on plants which early produced spurred corollas, the spurless flowers often are the only ones produced. Forma *heterantha* is, then, a peculiarly interesting reversionary form.

Hydrophyllum virginianum L., forma **simplicifolium**, f. nov. (tab. 502), foliis simplicibus laminis 4–9 cm. longis lobis obtusis; calicibus 3–4 mm. longis; corollis 5–6 mm. longis lobis angustis.—Vermont: rich woods, Charlotte, June 6, 1879, *Pringle* (type in Gray Herb.).

The extraordinary plant shown in plate 502, × 2/5, was labelled by the late Sereno Watson as an unpublished new species. Its publication was stopped by a letter coming from Pringle, stating that search through the area showed that no fruit was set and that in some cases forma *simplicifolium* was springing from rhizomes which likewise bore the typical large-flowered and large- and pinnate-leaved *Hydrophyllum virginianum*. This letter of Pringle's suggests that forma *simplicifolium* is a root-sport. It is so remarkable that it would be of great interest to rediscover it.

Hackelia **americana** (Gray), comb. nov. (Plate 503). *Echinospermum deflexum*, var. *americanum* Gray in Proc. Am. Acad. xvii. 224 (1882). *Lappula deflexa*, var. *americana* (Gray) Greene, Pittonia, ii. 183 (1891). *L. americana* (Gray) Rydberg in Bull. Torr. Bot. Cl. xxiv. 294 (1897). *Hackelia deflexa* sensu I. M. Johnston in Contrib. Gray Herb. n. s. lxviii. 45 (1923), as to North American plant, not (Wahlenb.) Opiz. *H. deflexa*, var. *americana* (Gray) Fernald & Johnston in Fernald in Rhodora, xxvi. 124 (1924).

Although all students of the *Boraginaceae*, except Rydberg, have treated the plant of calcareous slopes and bluffs, which occurs from the Gaspé Peninsula, Quebec to southern British Columbia, south interruptedly to northern New Brunswick, northern Vermont, the Bruce Peninsula, Ontario, northern Michigan, Wisconsin, Iowa, Nebraska, Montana, Idaho and Washington, as conspecific with the Eurasian *Hackelia deflexa* (Wahlenb.) Opiz (Plate 504) (or *Myosotis deflexa* Wahlenb., *Echinospermum deflexum* (Wahlenb.) Lehm., *Lappula deflexa* (Wahlenb.) Roth), there are several very marked characters which separate them.

Gray's original account, under *Echinospermum*, was as follows:

"E. deflexum, Lehm. Nutlets only marginally glochidiate, with the dorsal disk minutely scabrous: in var. Americanum (which makes some approach to *E. Virginicum*) the somewhat more granulate dorsal disk

not rarely bears two or three small glochidiate prickles on an obscure mid-nerve!"

Gray had four specimens before him: Clinton County, Iowa, *Geo. D. Butler:* Lake Winnipeg, *Bourgeau:* Saskatchewan, *Bourgeau:* West Kootenay, *Lyall.* The Bourgeau sheet from Saskatchewan alone bears Gray's varietal name in his hand and the pocketed fruits with his memoranda; it should stand as the TYPE. The character used by Gray is wholly variable; consequently, in revising the material in the Gray Herbarium in 1915, Mr. J. Francis Macbride ticketed it all *Lappula deflexa.* These revision-labels of Macbride's have superimposed upon them those of Dr. I. M. Johnston in 1923, agreeing as to identity, but calling the plant *Hackelia deflexa,* an unequivocal reduction of the American plant to the species of eastern Europe and Asia maintained in Johnston's detailed *Restoration of the Genus Hackelia*— Contrib. Gray Herb. n. s. lxviii. 45 (1923). Very familiar with the American plant as it occurs on the limy talus and bluffs of Gaspé, I could not feel that its broader and more acuminate leaves and the narrower and straight-edged deltoid nutlets indicated exact identity with the Eurasian plant with narrow leaves and more ovate nutlets. I consequently induced Dr. Johnston in 1924 to join me in reviving var. *americana* under *H. deflexa.*

Now, however, faced with the necessity of reviewing the situation in rewriting Gray's Manual, I find so many differences that I am unable to unite the Old World *Hackelia deflexa* and the American *H. americana* and in the Gray Herbarium am superimposing a third revision-slip on the two already there! Briefly the differences are these:

H. DEFLEXA (PLATE 504, FIGS. 1–7). Cauline leaves linear-lanceolate to narrowly oblanceolate, obtuse or merely acute, 0.25–2 cm. broad; racemes with some flowers usually supraaxillary (FIGS. 1–3), the mature pedicels mostly 0.5–2.5 cm. apart; bracts (FIGS. 1–3) of the ascending racemes well developed, the lower and usually all with dilated obtuse or merely acutish blades; expanded corollas (FIG. 4) 3–6 mm. broad; mature fruit (FIGS. 5–7) with nutlets intact and, including glochidia, 4–6 mm. long; open back of mature nutlet (FIGS. 5–7) ovate, 1.5–2 mm. broad, with blunt pebbling and with an elevated wing-margin formed by the fused lanceolate flat bases of the glochidia.

H. AMERICANA (PLATE 503). Cauline leaves elliptic-lanceolate to narrowly elliptic-ovate, mostly acuminate, the principal ones 0.5–3 cm. broad; flowers mostly approximate to their bracts (FIGS. 1, 3 and 4), the mature pedicels 3–10 (rarely –20) mm. apart; bracts (FIGS. 1, 3 and 4) of the less ascending racemes poorly developed, the lowest with lance-acuminate blades, all the others greatly reduced and inconspicuous,

Photo. H. G. Fernald.

HYDROPHYLLUM VIRGINIANUM, forma SIMPLICIFOLIUM: TYPE, × 2/5.

Photo. H. G. Fernald.

HACKELIA AMERICANA: FIG. 1, portions of plant, × 1, from Michigan; FIG. 2, expanded flower, × 4, from Michigan; FIGS. 3 and 4, fruiting branches, × 1, from Quebec; FIG. 5, fruit, × 8, from Quebec; FIG. 6, nutlet, × 8, from Michigan.

linear-attenuate; expanded corollas (FIG. 2) 1.5–3 mm. broad; mature fruit (FIGS. 5 and 6) including glochidia, 3–4.8 mm. long; open back of mature nutlet narrowly deltoid-ovate, 1–1.5 mm. broad, muriculate-pebbled, the marginal glochidia mostly distinct and linear-subulate.

In the plates illustrating details of the two species the habit is shown, × 1; the portions of inflorescence showing bracts and pedicels, × 1; details of flowers, × 4 and fruits, × 8. In *Hackelia americana* the calyx has fine and less rigid strigose pubescence than in *H. deflexa;* and the backs of the nutlets are more generally hispid than in *H. deflexa.* The latter character is too variable, however, to be emphasized, as is the tendency in *H. americana* sometimes to bear a few glochidia (FIG. 6) on the back of the nutlet. When these occur *H. americana* somewhat suggests *H. virginiana* (L.) I. M. Johnston. The latter has foliage similar to that of *H. americana* but larger, and its flowers are nearly as small and its racemes similarly bracted; but in *H. virginiana* the short-pediceled fruits (PLATE 504, FIG. 8) are subglobose and the ovate backs of the nutlets are almost hidden by the abundant glochidia.

I am taking up *Hackelia* Opiz for the species with deflexed pedicels which have long been included under *Lappula.* This I do in deference to the vastly superior knowledge of generic lines in the *Boraginaceae* of Dr. Johnston. In his *Restoration of the Genus Hackelia,* already referred to, he gave the generic distinctions as follows:

"LAPPULA. Annual; inflorescence abundantly bracteate; pedicels erect; gynobase subulate, 5–10 times as tall as broad, about equaling the nutlets; style surpassing the nutlets; nutlets narrowly attached all along the well developed medial ventral keel.

HACKELIA. Biennial or perennial; inflorescence naked or rarely sparsely bracteate; pedicels recurved or deflexed in fruit; gynobase pyramidal, less tall than broad; style definitely surpassed by nutlets; nutlets attached by a large oblique submedial ovate or deltoid areola; ventral keel extending over only upper half of nutlet."

The characters of the fruit and the gynobase are, I take it, constant; so, apparently, is the duration of the plants. The type of *Hackelia, H. deflexa,* has a bract opposite or alternating with many or all flowers; so have the two species of Atlantic North America above noted. As a fundamental generic character the *lack* of bracts is not well displayed in these three species. It is likewise significant that in 1924, in a synopsis of the American species of *Lappula,* which in 1923 had as one of its generic distinctions "style surpassing the nutlets", the monographer should have used as a key-character

separating *L. brachystyla* from *L. Redowskii* "Style exceeded by nutlets" in the former, opposed to "Style surpassing nutlets" in the latter.

Erigeron elatus Greene, var. **oligocephalus** (Fern. & Wieg.), comb. nov. *E. acris*, var. *oligocephalus* Fern. & Wieg. in Rhodora, xii. 226 (1910) as to type, *Fernald & Wiegand*, no. 4138. Plate 505, figs. 1 and 2.

The species of *Erigeron* § *Trimorphaca* (Cass.) DC. are as baffling as any in the genus. In temperate eastern North America the section is represented by the quite characteristic *E. lonchophyllus* Hook. (*E. armerifolius* Turcz.) on Anticosti, the Mingan Islands and adjacent mainland of Saguenay County, Quebec, there isolated from the West, and the three very characteristic plants which have passed as *E. acris* L. and varieties of it. Typical *E. acris* of Europe (extending across Asia) does not seem to occur in North America. Habitally somewhat like the Eurasian and North American plant which has erroneously passed as *E. acris* (or as its var. *droebachensis* (O. F. Muell.) Blytt or var. *asteroides* (Andrz.) DC.), it has nonglandular peduncles and involucres, the latter coarsely hispid (fig. 5). The wide-ranging plant which crosses North America has glandular-pruinose peduncles (fig. 4) and the involucral bracts essentially glabrous except for glandularity or viscidity. This is *E. elongatus* Ledeb. Ic. Fl. Alt. i. 9, t. 31 (1829) which was more fully described by Ledebour in Fl. Alt. iv. 91 (1833). It is also, perhaps, *E. droebachensis* O. F. Mueller in Fl. Dan. v. fasc. xv. t. dcccIxiv (1782), which was published in a largely polynomial work and which did not receive validation, apparently, until taken up by Fries, Summ. Veg. Scand. 183 (1846). The exact application of the name *E. droebachensis* is open to doubt, several Scandinavian authors placing it with *E. acris*, others (Lindman, for instance) indicating it as a mixture. Our plant is likewise, apparently, the one treated by DeCandolle, Prodr. v. 290 (1836) as *E. acris*, var. *asteroides*, based on the doubtful *E. asteroides* Andrz. The first name for this plant which is wholly free from doubt and the one used by Lindman, Hultén and other progressive students of boreal floras is *E. elongatus* Ledeb. Later names are *E. yellowstonensis* A. Nels. in Bot. Gaz. xxx. 198 (1900) and *E. lapilutcus* A. Nels. in Coult. & Nels. Man. Bot. Rocky Mts. 530 (1909). In the Rocky Mountains *E. elongatus* sometimes has hispid peduncles and involucres; consequently Gray took it to be true *E. acris* and under the latter name he

included specimens of all the plants here considered, even including *E. lonchophyllus*. All these Rocky Mountain specimens which I have seen, however, of the tall and stiff plant have the pruinose-glandular peduncles and bracts, the glands somewhat hidden by the long trichomes. To me it seems to be merely an extreme of *E. elongatus*.

Erigeron elatus Greene, Pittonia, iii. 164 (1897), said to be *E. alpinus*, var. *elatus* Hook. Fl. Bor.-Am. ii. 18 (1834), was given a full description by Greene. Its stems "bearing at summit either a solitary rather large head, or 3 to 5, which are slender-peduncled and subcorymbose . . . involucres 4 or 5 lines high and 6 in breadth, bracts linear-acuminate, almost hispidly short-hirsute, not glandular, unequal, the outer little more than half the length of the inner" show that Greene was describing, as he said, a plant "common in the mountains of British Columbia, where Mr. Macoun has repeatedly collected it." Plants sent out by Macoun as *E. elatus* and similar ones of earlier date are exactly the plant called by me *E. acris*, var. *arcuans* in RHODORA, xxviii. 236 (1926). A characteristic involucre, × 2, is shown in FIG. 3.

As I see it, we must accept *Erigeron elatus* as the plant clearly defined by Greene, although he drew his name from *E. alpinus*, var. *elatus* Hook. Fl. Bor.-Am., for there is absolutely nothing in Hooker's account to show what he had. *E. alpinus* is a very definite European species not represented with us, except by *E. borealis* (Vierh.) Simmons in arctic America; and it differs from all representatives of *E. acris* in having double, instead of single pappus. Hooker, misidentifying something as *E. alpinus*, had a var. β. without name, and "γ. *elata;* subpedalis." Surely the mere statement of height, without any other character, is not enough; at best *E. alpinus*, var. γ. *elatus* Hook. was a *nomen submudum*. It so happens that Hooker gave to Asa Gray as his var. γ. *elatus* a specimen which is not the small-headed plant described by Greene. It seems to be the large-headed extreme which is represented by the type of *E. acris*, var. *oligocephalus* Fern. & Wieg. In view of Greene's clear and unusually careful definition of the smaller-headed extreme of *E. elatus* and Hooker's quite undistinguishing word under his *E. alpinus*, var. γ. *elatus*, it would be pushing the type-concept to its utmost absurdity to say that Greene's *E. elatus* is not the plant he accurately described, because, without more than wrongly guessing as to the identity of Hooker's plant, he cited the latter. I, therefore, maintain *E. elatus* Greene for

the plant he described, treating the seeming source of the name, *E. alpinus*, var. γ. *clatus* Hooker, as inadequately defined and, therefore, not adequately published. Doubtless some extremely literal botanists will view the matter differently!

As I just now interpret the representatives of *Erigeron* § *Trimorphaea* ("just now" because any treatment is unsatisfactory and tentative) in temperate eastern North America, they may be distinguished by the following key.

a. Peduncles glandular-pruinose or viscid; involucral bracts glabrous or nearly so, glandular or viscid; inflorescence an elongate raceme or thyrsiform to corymbiform panicle of (4–)7–80 heads on stiffly spreading-ascending peduncles; involucres 5–8 mm. high; stems 2–8 dm. high. . . . . 1. *E. elongatus.*

a. Summits of peduncles and involucral bracts copiously hispid or villous, glandless; stems 0.2–4.5 dm. high. . . . *b.*

b. Cauline leaves narrowly linear; heads 1–70, on erect peduncles; no filiform pistillate flowers between the marginal ligulate and the perfect central flowers.

Stems 1–4.5 dm. high; leaves scattered up the stem into the inflorescence; some of the 3–70 peduncles in the axils overtopped by the leaves. . . . . 2. *E. lonchophyllus.*

Stems 0.2–1.3 dm. high; leaves crowded at base, the cauline reduced to tiny linear bracts; heads 1 or 2 (rarely 3), terminating the scapiform stem 2a. *E. lonchophyllus*, var. *laurentianus.*

b. Cauline leaves linear-oblong, lanceolate or oblanceolate; heads 1–8, on elongate flexuous or arching peduncles; filiform pistillate flowers forming a ring between the ligulate and the perfect tubular central flowers.

Involucres 5–9 mm. high, of 20–36 bracts, the outer bracts ½–nearly equaling the inner; disks of leading heads 0.8–1.5 cm. broad. . . . . 3. *E. elatus.*

Involucres 7–12 mm. high, of 36–60 bracts, the outer mostly about equaling the inner; disks of leading heads 1.5–2 cm. broad. . . . . 3a. *E. elatus*, var. *oligocephalus.*

1. E. ELONGATUS Ledeb. Ic. Fl. Alt. i. 9, t. 31 (1829). *E. drocbachensis* sensu Am. botanists, perhaps not *E. drocbachensis* O. F. Muell. in Fl. Dan. v. fasc. xv. t. dcccIxiv (1782), chance binomial in polynomial volume, validated by Fries, Summ. Veg. Scand. 183 (1846). *E. glabratus* Hook. Fl. Bor.-Am. ii. 18 (1834), not Hoppe. *E. acris*, var. *asteroides* sensu DC. Prodr. v. 290 (1836), based on the doubtful *E. asteroides* Andrz. *E. acris* and var. *drocbachensis* at least in sense of Gray, Syn. Fl. N. Am. i². 219, 220 (1884). *E. yellowstonensis* A. Nels. in Bot. Gaz. xxx. 198 (1900). *E. lapilutcus* A. Nels. in Coult. & Nels. Man. Bot. Rocky Mts. 530 (1909).—Damp banks, open sands, thickets and clearings, Hamilton River, Labrador Peninsula to Alaska, south to Anticosti Island and Gaspé Peninsula, Quebec, northern New Brunswick, northern Maine, northern Michigan, Manitoba, Saskatchewan, Colorado, Utah and Oregon; northern Eurasia.—An involucre, × 2, is shown in FIG. 4.

Photo. H. G. Fernald.

HACKELIA DEFLEXA: FIG. 1, portions of plants, × 1, from Torne Lappmark; FIG. 2, fruiting branch, × 1, from the Altai; FIG. 3, branches, × 1, from Bohemia; FIG. 4, flower, × 4, from Torne Lappmark; FIG. 5, fruit, × 8, from Songaria; FIG. 6, fruit, × 8, from Switzerland; FIG. 7, nutlet, × 8, from Norway.

H. VIRGINIANA: FIG. 8, fruit, × 8, from Massachusetts.

Photo. H. G. Fernald.

ERIGERON ELATUS: FIG. 3, head, × 2.

E. ELATUS, var. OLIGOCEPHALUS: FIG. 1, one of TYPE-SPECIMENS, × 1; FIG. 2, head, × 2.

E. ELONGATUS: FIG. 4, head, × 2.

E. ACRIS: FIG. 5, head, × 2.

E. BOREALIS: FIG. 6, head, × 2.

2. E. LONCHOPHYLLUS Hook. Fl. Bor.-Am. ii. 18 (1834). *E. armerifolius* Turcz. ex DC. Prodr. v. 291 (1836); *E. armeriaefolius* Gray in Proc. Am. Acad. viii. 648 (1873) and Syn. Fl. N. Am. i². 220 (1884), change of spelling. *E. racemosus* Nutt. Trans. Am. Phil. Soc. n. s. vii. 312 (1841).—Calcareous gravels, meadows and ledges, Mingan Islands and Anticosti Island, Quebec; Yukon and Alaska to South Dakota, New Mexico and California; Asia.

2a. Var. LAURENTIANUS Victorin in Trans. Roy. Soc. Can. ser. 3, xx. (sect. v). 476 (1926).—Mingan Islands, Anticosti Island and adjacent mainland of Saguenay County, Quebec.

3. E. ELATUS Greene, Pittonia, iii. 164 (1897). *E. acris*, var. *oligocephalus* Fern. & Wieg. in RHODORA, xii. 226 (1910), excluding type. *E. acris*, var. *arcuans* Fern. in RHODORA, xxviii. 236 (1926).—Calcareous shores, gravels and turf, River Ste. Anne des Monts, Gaspé County, Quebec; northeastern Manitoba (Churchill) to Mackenzie, south in the Rocky Mountains of Alberta and British Columbia. An involucre, × 2, is shown in FIG. 3.

3a. Var. OLIGOCEPHALUS (Fern. & Wieg.) Fernald. *E. acris*, var. *oligocephalus* Fern. & Wieg. in RHODORA, xii. 226 (1910), as to type. *E. borealis* sensu Fernald in RHODORA, xxviii. 236 (1926), not (Vierh.) Simmons (1913).—Calcareous slopes, Labrador, easternmost Saguenay County, Quebec (Blanc Sablon, formerly included in Labrador) and northern Newfoundland. FIG. 1 shows one of the type-specimens, × 1; FIG. 2, an involucre, × 2.

As already pointed out, a specimen from somewhere in the Canadian Rocky Mountain region given to Gray by Hooker, as belonging to his inadequately published *Erigeron alpinus*, γ. *elatus*, is near if not quite *E. elatus*, var. *oligocephalus*. In 1926, accepting the identification by students of the Scandinavian and Greenland floras, I treated the plant of Labrador and Newfoundland as *E. borealis*. Abundant material of the latter plant of northern Europe and Greenland now shows it to be only slightly and perhaps not satisfactorily separable from the European *E. alpinus*. In its more ligneous rhizome, its firm and consistently small cauline leaves, its usually solitary erect head, its more villous involucre, its comparatively broad and conspicuous ligules and its double pappus *E. borealis* is quite distinct from *E. elatus* and its var. *oligocephalus*. A head of the Swedish *E. borealis* is shown, × 2, in FIG. 6.

ERIGERON RAMOSUS (Walt.) BSP., forma **discoideus** (Robbins), comb. nov. *E. strigosus* Muhl., var. *discoideus* Robbins ex Gray, Man. ed. 5: 237 (1867). *E. ramosus*, var. *discoideus* (Robbins) BSP. Prelim. Cat. N. Y. Pl. 27 (1888).

AMBROSIA TRIFIDA L., forma **integrifolia** (Muhl.) comb. nov.

A. integrifolia Muhl. in Willd. Sp. Pl. iv. 375 (1805). *A. trifida*, β. *integrifolia* (Muhl.) Torr. & Gray, Fl. No. Am. ii. 290 (1842).

The Varieties of Bidens coronata (plate 506).—*Bidens coronata* (L.) Britton, the plant which long passed by the later name *B. trichosperma* (Michx.) Britton (not the strictly southern *B. mitis* (Michx.) Sherff, which long passed erroneously as *B. coronata*) has four well defined geographic varieties. As treated by Sherff in his *Genus Bidens*, pt. 1: 221 (1937) only two varieties are recognized:

"Foliola plerumque lanceolato-linearia et inciso-dentata, achaeniis corpore 5–7 mm. longis.....*B. coronata* sensu stricto.
Foliola (segmentave) angustissime linearia et saepe etiam integra, achaeniis minoribus.....Var. β. *tenuiloba.*"

According to Sherff's treatment var. *tenuiloba*, based by Gray on material from Indiana and Illinois, occurs "With the species proper and usually commoner."

When, however, we attempt to place specimens with lanceolate leaf-segments and achenes 9 mm. long, others with lanceolate segments and achenes 4.5 mm. long we become puzzled; when, furthermore, plants with linear segments only 1 mm. broad have achenes 7.5 mm. long, the inadequateness of present treatments of the species becomes more apparent. I am accordingly proposing the following treatment which recognizes four fairly defined geographic varieties.[1]

[1] The geographic segregates within the species and the geographic ranges in general would have been more evident if Sherff had followed the conventional geographic sequence in citation of specimens. To most users of a monograph the arrangement of cited specimens in a familiar geographic sequence is of far greater importance than the mere citation of specimens in alphabetical sequence of collector's names. The latter is a secondary item; the former records a fact usually of permanent significance. Without a logical geographic sequence in citation grave errors enter the generalizations. For instance, on his p. 315 Sherff gives the range within the United States of *Bidens laevis:* "From New Hampshire and Massachusetts southward along the coast to Florida and westward from Florida to California." From this generalization one would never guess that *B. laevis* grows in western New York and in West Virginia. Neither of these areas is "along the coast" nor "westward from Florida to California." Nevertheless, under the cited specimens one from Cayuga Marshes, New York comes between specimens recorded from Argentina and from Rhode Island, merely because the Argentina plant was distributed in the series, *Chloris Platensis Argentina*, the New York plant was collected by *Clinton* and the Rhode Island specimen seen was from *Congdon*. The West Virginia specimen cited is lost in five pages of geographically disorganized matter under the name *Guttenberg*.

Handel-Mazzetti has already protested this unscientific method of citing specimens (Oesterr. Bot. Zeitschr. lxxxvii.[2] 154) and he specially protests the incorrect entering under V of the Germanic prefix "von." He might have noted also that ubiquitous and unidentifiable collector "*anon.*" whose specimens are recorded in this sequence: Pennsylvania, Hawaii, and North Carolina. Every experienced taxonomist with whom I have conferred has urged the protesting of this novel method of citation.

a. Longest central achenes 6–9 mm. long.
Awns of central achenes 2.8–3.7 mm. long; larger outer achenes 5–6 mm. long, with awns mostly 2–2.6 mm. long; larger leaf-segments 4–20 mm. broad; outer involucre loosely ascending or spreading; plant of the interior ..... *B. coronata*, var. *typica.*
Awns of central achenes 0.6–1.8 mm. long; larger outer achenes 3.7–6 mm. long, with awns 0.6–1 mm. long; larger leaf-segments 1–12 mm. broad; outer involucre appressed-ascending ..... Var. *brachyodonta.*
a. Longest central achenes 4.5–6 mm. long; larger leaf-segments 1–12 mm. broad.
Ligules 1.5–2.5 cm. long; awns of central achenes 1–2 mm. long; larger outer achenes 3–5.2 mm. long, with awns 0.4–1.6 mm. long; plants of the interior ..... Var. *tenuiloba.*
Ligules 1.2–1.7 cm. long; awns of central achenes 1.8–3 mm. long; larger outer achenes 4.7–6 mm. long, with awns 1.5–1.8 mm. long; plant of Atlantic states ..... Var. *trichosperma.*

B. CORONATA (L) Britton, var. **typica.** Figs. 4 and 5. *Corcopsis coronata* L. Sp. Pl. ed. 2, ii. 1281, as to descr. and specimen matching it in Herb. L. (1763). *Diodonta coronata* (L.) Nutt. in Trans. Amer. Phil. Soc. ser. 2, vii. 360 (1841). *B. coronata* (L.) Britton in Bull. Torr. Bot. Cl. xx. 281 (1893); Sherff in Bot. Gaz. lvi. 495 (1913) and Gen. Bidens, pt. 1: 221, in part, t. lix., figs. *m.* and *p–u* (1937).—Prairies, swales and rich bottoms, Connecticut Valley, Connecticut to southern Ontario and Nebraska, south to Delaware Valley, New Jersey, Pennsylvania, Ohio, Indiana and Illinois.

Var. **brachyodonta**, var. nov. (TAB. 506, FIG. 1–3), foliorum segmentis linearibus vel anguste lanceolatis 1–12 mm. latis; involucris exterioribus 4.5–10 mm. longis, interioribus 5.5–7 mm. longis; ligulis 1.5–2.8 cm. longis; achaeniis exterioribus 3.7–6 mm. longis 1.9–2.4 mm. latis aristis 0.6–1 mm. longis; achaeniis centralibus longioribus 6–7.5 mm. longis 1.2–1.8 mm. latis aristis 0.6–1.8 mm. longis.—Bogs and peaty swamps, Essex County, Massachusetts to Delaware. The following, from a large series, are characteristic. MASSACHUSETTS: swale near Pilling Pond, Lynnfield, October 21, 1917, *Fernald;* wet sphagnous clearing near Chebacco Lake, Essex, September 11, 1913, *Fernald, Hunnewell & Long*, no. 10,690; black spruce bog, North Reading, August 31, 1932, *W. B. Drew;* Fresh Pond, Cambridge, September 3, 1853, *Wm. Boott;* wet meadows of Neponset River, Dedham, September 6, 1901, *Day & Fernald* in Pl. Exsicc. Gray. no. 48 (as *B. trichosperma*); Broad Meadows, Needham, September 13, 1891, *T. O. Fuller;* Lakeville, September 25, 1903, *E. W. Hervey;* open swamps, Easton, October 18, 1919, *C. F. Batchelder;* swamp, Raynham, September 15, 1923, *Cheever & Knowlton;* boggy meadows near Fresh Pond, Dennis, September 2, 1918, *Fernald*, no. 17,612; cranberry bogs, Harwich, October 13, 1918, *Fernald*, no. 17,613 (TYPE in Gray Herb.). RHODE ISLAND: South Kingston, 1850, *S. T. Olney.* NEW YORK: Merricks, Long Island, September 8, 1916, *House.* DELAWARE: high

ground near Newport, New Castle County, September 9, 1899, *Canby*.

With the exception of var. *typica* in the Connecticut Valley, var. *brachyodonta* is the one variation of *Bidens coronata* in New England and apparently the only one on Long Island. It is presumably in New Jersey, since Canby collected it in Delaware. Its leaf-segments vary rather indiscriminately, even in the same colonies, from narrowest linear to lanceolate. Its achenes are nearly as large as in var. *typica* but the awns are strikingly shorter.

Var. TENUILOBA (Gray) Sherff in Bot. Gaz. lxxxvi. 446 (1928). FIGS. 6 and 7. *Coreopsis trichosperma* Michx., var. *tenuiloba* Gray, Syn. Fl. N. Am. i^2. 295 (1884). *B. trichosperma*, var. *tenuiloba* (Gray) Britton in Bull. Torr. Bot. Cl. xx. 281 (1893).—Bogs and swales, southern Ontario to Minnesota, south to Ohio, Indiana, Illinois, Iowa and Nebraska.

Although var. *tenuiloba* has been treated as merely a narrow-lobed and small-fruited phase of *Bidens coronata*, it should be noted that its leaf-segments are highly variable and may be quite like those of var. *typica*. The original material which Gray had before him showed such range of variation in the foliage; but its achenes are shorter than in var. *typica* and their awns are very much shorter. The series seems to be a reasonably defined variety and, singularly enough, its counterpart is on the coastal plain from New Jersey to Florida, which shows in length of awns a closer approach to var. *typica* of the interior. The latter plant is

Var. **trichosperma** (Michx.) comb. nov. FIGS. 8 and 9. *Coreopsis trichosperma* Michx. Fl. Bor.-Am. ii. 139 (1803). *B. trichosperma* (Michx.) Britton in Bull. Torr. Bot. Cl. xx. 281 (1893).—Bogs and swamps, New Jersey and eastern Pennsylvania to Florida. The following, from among many sheets, are typical. NEW JERSEY: Moonachie, September 21, 1901, *E. E. Magee;* Woodbridge, September 21, 1889, *J. R. Churchill.* PENNSYLVANIA: wet soil, Tullytown, September 20, 1930, *W. M. Benner.* VIRGINIA: tidal marsh, Capitol Landing, Queen's Creek, Charles City County, *Grimes*, no. 4291; border of tidal marsh along Gray's Creek, near Cross Creek Landing, south of Swann Point, *Fernald & Long*, no. 6909 (see FIG. 8); Northwest, Norfolk County, *Heller*, no. 1247. GEORGIA: swamp of Satilla River, near Woodbine, Camden Co., *Harper*, no. 1562 (see FIG. 9).

Var. *trichosperma* is, if the slight representation in the Gray Herbarium from Virginia southward can be taken as indicative, the only variation of *Bidens coronata* in the Southeast. In its very short

achenes it approaches, as has repeatedly been noted, the southern *B. mitis* (Michx.) Sherff, but the achenes are minutely strigose-ciliolate, with awns 1.5–3 mm. long, whereas all good achenes of *B. mitis* (FIG. 10), which I have examined, run smaller (2–5 mm. long), have glabrous margins and have shorter awns (at most up to 1 mm. long on the central achenes, almost obsolete and blunt on the marginal achenes). Although Sherff (Genus Bidens, pt. 1: 231, in footnote) specially selects Harper's no. 1562 (FIG. 9) as typical of *B. mitis*, the sheet thus marked by him in the Gray Herbarium has, it seems to me, the characteristic achenes of *B. coronata*, var. *trichosperma*. As to the identity of *Coreopsis trichosperma*, Michaux described it from "humidis Carolinae superioris" immediately before his *C. mitis*. Mr. J. Francis Macbride, now in Paris, has most kindly made comparison of achenes with those of Michaux's two types involved and reports that the type of *Coreopsis trichosperma* is too young for proper comparison but that the plant looks like the coastwise series with narrow leaf-segments. The type of *C. mitis* has 2 central achenes left. One of these has been sent me, through Mr. Macbride, by Professor Pellegrin for examination and return to the Michaux herbarium. It is quite smooth on the margins, 5 mm. long and with no true awns, merely broadly deltoid low teeth. This achene has been photographed, much enlarged and prints from the negative can be supplied by the Gray Herbarium. It is much larger than those shown in FIG. 10. It is closely matched by achenes of *Grimes*, no. 4546, from grassy bank by Dismal Swamp Canal, Wallacetown, Virginia. The latter plant is almost exactly duplicated by *Fernald, Long & Fogg*, no. 5136, from fresh to brackish swales of North Landing River, near Creed's, Virginia. Grimes's material, in fruit, was collected in October; the flowering material from North Landing River (distributed as *B. coronata*, var. *tenuiloba*) on September 9th. It is desirable to secure material of it in October. I wish here to express to Professor Pellegrin and Mr. Macbride my great appreciation of their help.

BIDENS **infirma**, sp. nov. (TAB. 507, FIG. 1–3), herba annua diffuse ramosa 1–2.5 dm. alta; foliis membranaceis anguste petiolatis, laminis anguste lanceolatis apice basique attenuatis, margine argute grosseque serrato-dentatis; capitulis discoideis campanulatis 7–13-floris 4–8 mm. diametro pedunculatis, pedunculis tenuibus 1–3 cm. longis; involucris glabris; bracteis exterioribus 2–4 linearibus vel lanceolatis, interioribus oblongis subacutis 5–8 mm. longis; achaeniis planis oblanceolatis apice valde rotundatis vel convexis strigosis utrinque

unicostatis, margine sparse antrorso-ciliatis, exterioribus 4–6.3 mm. longis 1–1.5 mm. latis inermibus, centralis 5.5–8 mm. longis 1–1.4 mm. latis plerumque breviter aristatis, aristis divergentibus 0.2–0.8 mm. longis antrorse setulosis. *B. heterodoxa*, var. *atheistica* Fernald in Rhodora, xxxiv. 116 (1934).—Tidal mud and slaty intertidal gravels of the St. Lawrence, Bellechasse County, Quebec: Anse St. Vallier, September 15, 1931, *Fernald*, nos. 2952, 2955 (type in Gray Herb.), 2960; St. Vallier, 26 Août 1931, *Victorin, Rolland & Jacques*, no. 44,152 (as *B. Eatoni*), 1 Octobre 1932, *Victorin, Rolland & Jacques*, no. 44,116 (as *B. Eatoni*).

Bidens infirma is the little plant of the tidal flats of Bellechasse County which I described as *B. heterodoxa*, var. *atheistica*. So long as it was considered a variety of *B. heterodoxa*, with parallel varieties *orthodoxa* and *agnostica*, its varietal name had some appropriateness. For a species apart from them its original name would be quite meaningless. I have, therefore, exercised the right, treating it as a species, of giving a new name.

Bidens infirma is at once distinguished by the remarkable achenes (fig. 3) with rounded or dome-like summits, the outer ones unarmed, the intermediate and central ones either awnless or with very short and strongly divergent upwardly barbellate awns. *B. heterodoxa* (figs. 4–6) has the achenes truncate at summit, as in most of our species, typical *B. heterodoxa* (fig. 4) of Prince Edward Island and the Magdalen Islands with long ascending upwardly barbellate awns, var. *orthodoxa* (fig. 5) of the Magdalen Islands with them retrorsely barbed. Var. *agnostica* (fig. 6) differs from them in having the awns wholly or nearly barbless and slightly longer.

The photographs sufficiently indicate the strong specific claims of *Bidens infirma*. It is still another of the remarkable endemics of the intertidal flats of the St. Lawrence estuary.

Bidens frondosa L., forma **anomala** (Porter), comb. nov. *B. frondosa*, var. *anomala* Porter ex Fernald in Rhodora, v. 91 (1903).

For two to three decades it was thought that the plant with antrorsely barbellulate awns was essentially maritime. We now knew it to grow inland through much of the range of typical *Bidens frondosa*.

Bidens vulgata Greene, forma **puberula** (Wieg.) comb. nov. *B. frondosa* L., var. *puberula* Wiegand in Bull. Torr. Bot. Cl. xxvi. 408 (1899). *B. vulgata*, var. *puberula* (Wieg.) Greene, Pittonia, iv. 250 (1901). *B. puberula* (Wieg.) Rydb. Fl. Pr. Plains, 849 (1932).

Scattered through the range of typical glabrate *Bidens vulgata*, seemingly only a more pubescent form.

Photo. E. C. Ogden.

BIDENS CORONATA, var. BRACHYODONTA: FIG. 1, plant, × $\frac{2}{5}$; FIG. 2, outer (broad) and central (narrow) achenes, × 4, from TYPE, Harwich, Massachussetts; FIG. 3, achenes, × 4, from Lynnfield, Massachusetts.

Var. TYPICA: FIG. 4, achenes (outer broad, central narrow), × 4, from Delaware River; FIG. 5, achenes, × 4, from Illinois.

Var. TENUILOBA: FIG. 6, achenes (outer shorter), × 4, from TYPE, Illinois; FIG. 7, achenes, × 4, from Wisconsin.

Var. TRICHOSPERMA: FIG. 8, achenes (outer broader), × 4, from Virginia; FIG. 9, achenes, × 4, from Georgia.

B. MITIS: FIG. 10, achenes, × 4, from Florida.

Photo. E. C. Ogden.

BIDENS INFIRMA: FIG. 1, portion of TYPE, × 1; FIG. 2, head, × 2; FIG. 3, achenes (shorter marginal, longest central), × 4.

B. HETERODOXA: FIG. 4, achenes, × 4, from Prince Edward Island.

B. HETERODOXA, var. ORTHODOXA: FIG. 5, achene, × 4, from Magdalen Islands.

B. HETERODOXA, var. AGNOSTICA: FIG. 6, achene, × 4, from Connecticut.

Ratibida columnifera (Nutt.) Woot. & Standl., forma **pulcherrima** (DC.) comb. nov. *Obeliscaria pulcherrima* DC. Prodr. v. 559 (1836). *R. columnaris*, var. *pulcherrima* (DC.) D. Don in Sweet's Brit. Fl. Gard. ser. 2, iv. 361, pl. 361 (1838). *Lepachys columnaris*, var. *pulcherrima* (DC.) Torr. & Gray, Fl. N. Am. ii. 315 (1842). *R. columnifera*, var. *pulcherrima* (DC.) Woot. & Standl. in Contrib. U. S. Nat. Herb. (Fl. N. Mex.) xix. 706 (1915). *L. columnifera*, var. *pulcherrima* (DC.) Rydb., Fl. Prair. Pl. 838 (1932). *R. columnaris*, forma *pulcherrima* (DC.) W. M. Sharp in Ann. Mo. Bot. Gard. xxii. 70 (1935).

The necessity to make a new combination for the color-form of *Ratibida columnifera* with purple or purple-marked ligules arises through the failure of some authors to trail names to their ultimate sources. Both the generic and the specific names here involved need elucidation.

Rafinesque, with customary flexibility, had three generic names for the small American genus which, before him, had been included under *Rudbeckia*. In 1817 he published two of them, with very brief but technically sufficient and significant diagnoses and each with a previously published species of *Rudbeckia* cited as typical. In discussing segregates of *Rudbeckia* he said

"All the species with naked seeds as *R. pinnata &c.* must form my genus *Obelisteca*, and those with a simple perianthe, such as *R. columnaris* Pursh, my genus *Ratibida*. Raf."[1]

In later works Rafinesque maintained *Ratibida* and, unfortunately, many authors have dated the publication of this genus from one of the later treatments, not from the earliest publication. Thus Macbride, returning from *Ratibida* to the longer-used but really later *Lepachys*, said

"In accordance with Art. 38 of the International Rules of Botanical Nomenclature, *Lepachys* Raf. Journ. Phys. lxxxix. 100 (1819), although a later name than *Ratibida* Raf. Am. Monthly Mag. ii. 268 (1818), is retained since the latter was published "without diagnosis or reference to a former description under another name" and therefore "is not valid."[2]

And Rydberg, after using *Ratibida* for many years, dated from the American Monthly Magazine (Feb., 1818), instead of from Flora Ludoviciana (1817), swung, in his late period of conservatism, to *Lepachys* Raf. (1819), in synonymy referring to "*Ratibida* Raf., hyponym." Now, by the example of a hyponym given in the Century

[1] Raf. Fl. Ludov. 73 (1817).
[2] J. F. Macbride in Contrib. Gray Herb. n. s. no. lxv 45 (1922).

Dictionary, taken from F. S. Earle, Science, n. s. xix. 509 (March 25, 1904), "Some are *hyponyms*, never having been associated with a recognizable binomial species", it becomes clear that *Ratibida* as used by Rafinesque in 1818 was *not* a hyponym. Incidentally it should be noted that Macbride erred in stating that Rafinesque in 1818 gave no reference to a former description. Rafinesque was reviewing Pursh's Flora (1814) and in so doing took the opportunity to rename many of the species and genera. Of Pursh's *Rudbeckia columnaris* he said "125. *Rudbeckia columnaris* must form the genus *Ratibida* of Raf. fl. Miss."[1] *Ratibida* at this point had no diagnosis but it certainly was "associated with a recognizable binomial." Incidentally, Rafinesque referred back to an earlier publication. To be sure he called it "fl. Miss.", instead of Flora Ludoviciana, but that was a mild error for him! As already noted, in the latter work (1817) the genus was passably set forth and the objections to it arising from starting with 1818 disappear. Dr. W. M. Sharp has properly reinstated *Ratibida* in his study of the genus.[2]

In the same paper Sharp, however, rejects the first published specific name *Rudbeckia columnifera* Nuttall in Frasers' Cat. no. 75 (1813), and retains the long-used but later *R. columnaris* Sims in Curt. Bot. Mag. xxxix. plate 1601 (1814), Sharp giving the date of the latter as "1813." In regard to the date he does not state why he credits *R. columnaris* to 1813. The title-page distinctly says 1814. Presumably the new interpretation of date arose through the fact that plate 1601, like plates 1600 and 1602–1605, has the engraver's date "Dec. 1, 1813," while plates 1592–1599 are dated by the engraver "Nov. 1, 1813." The dates of the engravings, I take it, do not mean that these plates with their accompanying text were issued to the public on November 1 and December 1 respectively. The text with them indicates that they were issued considerably later.

Pursh's Flora Americae Septentrionalis, with the Preface dated "*December* 1813," was published in 1814, and in it he repeatedly cited plates in the Botanical Magazine prior to vol. xxxix. In the latter volume 4 North American species were originally described and also illustrated with the engraver's date "Nov. 1, 1813." These were *Oenothera missouriensis* (pl. 1592), *O. caespitosa* (pl. 1593), *Tradescantia subaspera* (pl. 1597) and *Helonias graminea* (pl. 1599); yet not

[1] Raf. in Am. Month. Mag. ii. 268 (Feb., 1818).
[2] W. M. Sharp in Ann. Mo. Bot. Gard. xxii. 62 (1935).

one of them was mentioned by Pursh in 1814. *Rudbeckia columnaris* (pl. 1601) was independently described by Pursh under that name, but with no reference to the account by Sims and the plate, Pursh renaming the earlier *R. columnifera* Nuttall in Frasers' Catalogue, which he cited. Added to the fact that Pursh nowhere cited any of the descriptions and plates in Bot. Mag. xxxix. we have the striking circumstance that, in the text accompanying the plates of other but previously published North American species, dated by the engraver "Nov. 1, 1813" or "Dec. 1, 1813," Pursh's Flora, even to exact page and plate, was regularly cited (see *Lophiola aurea*, pl. 1596; *Sabbatia calycosa*, pl. 1600; *Galardia bicolor*, pl. 1602). It should be clear, then, that *Rudbeckia columnaris* Sims did not antedate *R. columnaris* Pursh.

With the date of publication of *Rudbeckia columnaris* as well settled as is possible without full knowledge of the exact month and day of issue, the proper name for the species must be considered. Sharp, in the paper mentioned, sees no difficulty about taking up the generic name as sufficiently defined by Rafinesque's brief phrase of 1817; but he balks at using the first specific epithet for the species in hand, saying (l. c. 62, 63):

"The name *Rudbeckia columnifera* Nutt. was first published in "Fraser's Catalogue" in 1813. The description accompanying it is so indefinite that the name *R. columnifera* may be regarded as a *nomen subnudum*. Nuttall himself in the "Genera of North American Plants" in 1818 abandoned his name *R. columnifera* and recognized *Rudbeckia columnaris* Pursh."

The fact that Nuttall abandoned the name in 1818 is not significant, nor is it universally felt that Nuttall's original diagnosis of 1813 is not intelligible. Here it is:

"75 *Rudbeckia columnifera. ‡ Spontaneous varieties of this plant sometimes occur with bright fulvous flowers, colored like *Tagetes patula;* the stem is simple, seldom producing more than three flowers, which are of an uncommon length, appearing like a column of flosculi, subtended by 5–8 neutral florets, and a simple calyx."[1]

Certainly this is a far more intelligible diagnosis of a species than was the original characterization of *Ratibida* for a genus! Wooton & Standley, Macbride and Rydberg have all found it distinctive and, even if it seem to some only a "*nomen subnudum*" in spite of the three distinctive characters given, it should be noted that the name

[1] Nuttall in Frasers' Cat. no. 75 (1813).

Rudbeckia columnifera was understood by Pursh when, in 1814, he cited it without qualification as an exact synonym of his newly proposed *R. columnaris*. The name *R. columnaris* Pursh, Fl. Am. Sept. 575 (1814), with "R. columnifera, *Fraser catal.* 1813" definitely cited as the same, was, consequently, in part an illegitimate (or substitute) name for *R. columnifera* and to that extent it cannot be maintained!

There is no question about the plant which Nuttall described in Frasers' Catalogue. It was grown in the Frasers' garden from seed supplied by Nuttall; and in the year following Frasers' Catalogue it was published as *Rudbeckia columnaris* Sims in the Botanical Magazine, with a beautiful plate of the common yellow-rayed plant. The Sims plant "was introduced, we believe, by Mr. Nuttall, from the country of the Missouri; our drawing was taken at the Nursery of Messrs. J. and J. T. Fraser." *Rubdeckia columnifera* Nuttall (1813) and *R. columnaris* Sims (1814) were, then, based on the same material; the name *R. columnaris* Pursh (1814) was, in part at least, an illegitimate substitute for *R. columnifera*.

Only one other name is available for the yellow-rayed plant. This is *Ratibida sulcata* Raf. Journ. de Phys. lxxxix. 100 (1819); but that, too, was a substitute-name: "Son type est la *Rudbeckia columnari*[*s*] de Pursh, qui devra s'appeller *Ratibida sulcata*."

Cacalia **Muhlenbergii** (Sch. Bip.), comb. nov. *C. reniformis* Muhl. in Willd. Sp. Pl. iii[3]. 1735 (1804), not Lam. Fl. Fr. ii. 75 (1778). *Senecio Muhlenbergii* Schultz Bip. in Flora, xxviii. 499 (1845). *Mesadenia Muhlenbergii* (Sch. Bip.) Rydberg, Fl. Pr. Pl. 873 (1932).

In 1921 House, citing *Cacalia reniformis* as published in Willdenow's Species, vol. "73: 1753" (instead of vol. 3, pt. 3, p. 1735), pointed out that the name is invalidated by *C. reniformis* Lam. (1778). He, therefore, made for it the new combination *C. rotundifolia* (Raf.) House, N. Y. State Mus. Bull. nos. 233–234: 67 (1921), based upon *Mesadenia rotundifolia* Raf. New Fl. iv. 79 (1838), without discussion of what Rafinesque may have had.[1] As to the latter question, it is significant that *C. reniformis* Muhl. is a tall plant (4–9 ft.—*Gray*, Syn. Fl.; 0.9–3 m.—*Small;* 1–3 m.—*Rydberg*); that it has the leaves green on both sides (though paler beneath) as contrasted with the glaucous

[1] Incidentally, those who, like Small and Rydberg, have taken up for one section of *Cacalia* L. the name *Mesadenia* Raf. (1832 and 1838) pass over the fact that in 1828 Rafinesque had attempted to substitute an earlier *Mesadenia* Raf. Med. Fl. i. 198 (1828) for *Frasera* Walt. of the *Gentianaceae*. For *Mesadenia* Raf. (*Compositae*) the proper generic name, for those who consider it a genus, seems to be *Conophora* (DC.) Nwd. in Am. Midl. Nat. iii. 193 (1914).

foliage of *C. atriplicifolia* L., the lower ones very large ("often 2 feet wide"—*Gray*, Syn. Fl.; "10–60 cm. wide"—*Small;* "1–2.5 dm. wide" —*Rydberg*) and abundantly dentate, the cauline distinctly petioled. Rafinesque's *Mesadenia rotundifolia* was "2 or 3 feet high," with leaves "entire or repand glaucous beneath . . . lower . . . 3 or 4 inches long and broad . . . upper sessile." It is most probable that *Mesadenia rotundifolia* Raf. had nothing to do with *Cacalia reniformis* Muhl.; *Index Kewensis* even refers it to *Vernonia!* Had Dr. House, before publishing the combination *C. rotundifolia* (Raf.) House (1921), consulted the latter indispensible work he would have found that an Indian species was published as *C. rotundifolia* Willd. Sp. Pl. iii[3]. 1732 (1804), in the same treatment in which *C. reniformis* Muhl. was first described. Even if it is possible to guess what Rafinesque may have had, the name *C. rotundifolia* (Raf.) House (1921) is clearly antedated by *C. rotundifolia* Willd. (1804).

Explanation of Plates 497–507

Plate 497. Panicum recognitum, sp. nov.: fig. 1, type, × ½, from Albion, New Jersey, *Long*, no. 7671; fig. 2, base of cauline leaf, × 1, from the type; fig. 3, pubescence of sheath, × 10, from type; fig. 4, node, × 10, from type; fig. 5, pulvinus and base of panicle-branch, × 10, from type; fig. 6, spikelets, × 10, from type.

Plate 498. Panicum recognitum, sp. nov.: plant, × ½, showing autumnal branching, from type-station, *Long*, no. 4944.

Plate 499. Asarum canadense, forma Phelpsiae, f. nov.: type, × 1, from Gouverneur, New York, *Orra Parker Phelps*, no. 1143.

Plate 500. Agrimonia striata Michx.: fig. 3, fruit, × 8, from Franklin, Connecticut, October 2, 1906, *R. W. Woodward.*

A. striata, var. campanulata, var. nov.: fig. 1, plant, × 3/8, from Rincon Mountains, Arizona, *Blumer*, no. 3384; fig. 2, fruit, × 8, from Ramsey Cañon, Huachuca Mountains, Arizona, *Marcus E. Jones*, no. 24,920 (type).

Plate 501. Polygala verticillata L.: fig. 1, one of the two plants in the Linnean Herbarium, type of the species, × 1, courtesy of *Mr. Spencer Savage.*

Var. isocycla, var. nov.: fig. 2, one of several plants, × 1, from Frazer, Pennsylvania, *E. B. Bartram*, no. 1124 (type); fig. 3, raceme, × 4, of the type, to show fruit.

Var. sphenostachya Pennell: fig. 4, raceme, × 4, from Swope Park, Missouri, *Bush*, no. 7692 (isotype), to show fruit.

Plate 502. Sufficiently explained on p. 341.

Plate 503. Hackelia americana (Gray) Fernald: fig. 1, portions of a plant, × 1, from Burnt Bluff, Delta County, Michigan, *Fernald & Pease*, no. 3492; fig. 2, expanded flower, × 4, from no. 3492; fig. 3, fruiting branch, × 1, from Percé, Quebec, *Collins, Fernald & Pease* (*Pease*, no. 5482); fig. 4, fruiting branch, × 1, also from Percé; fig. 5, fruit, × 8, from same plant as fig. 3; fig. 6, separated nutlet, × 8, showing prickles on back, from Mackinac Island, Michigan, August 4, 1910, *J. R. Churchill.*

Plate 504. Hackelia deflexa (Wahlenb.) Opiz: fig. 1, portions of plants, × 1, from Torne Lappmark, *Alm* (Intern. Phytogeogr. Exc., 1925, no. 6285); fig. 2, fruiting branch, × 1, from the Altai, *B. K. Schishkin;* fig. 3, portions of racemes, × 1, from Bohemia, *Petrak*, Fl. Bohem. Morav. Exsicc., Lfg. V. no.

484; FIG. 4, flower, × 4, from same collection as FIG. 1; FIG. 5, fruit, × 8, from Songaria, *Schrenk;* FIG. 6, fruit, × 8, from above Zermatt, Switzerland, *Wilczek;* FIG. 7, separated nutlet, × 8, from Norland, Norway, *Ove Dahl.*

H. VIRGINIANA (L.) I. M. Johnston: FIG. 8, fruit, × 8, from Newton, Massachusetts, September 5, 1897, *E. F. Williams.*

PLATE 505. ERIGERON ELATUS Greene: FIG. 3, head × 2, from Carbon River, British Columbia, *Raup & Abbe*, no. 4270a.

E. ELATUS, var. OLIGOCEPHALUS (Fernald & Wiegand) Fernald: FIG. 1, one of the TYPE-SPECIMENS, Blanc Sablon, Labrador, *Fernald & Wiegand*, no. 4138; FIG. 2, head, × 2, from TYPE.

E. ELONGATUS Ledebour: FIG. 4, head, × 2, from Tracadigash Point, Carleton, Quebec, *Fernald & Weatherby*, no. 2472.

E. ACRIS L.: FIG. 5, head, × 2, from Mähr-Weisskirchen, Bohemia, *Petrak,* Fl. Bohem. Morav. Exsicc. Lfg. I, no. 92.

E. BOREALIS (Vierh.) Simmons: FIG. 6, head, × 2, from Jämtland, Sweden, July 15, 1934, *Nannfeldt.*

PLATE 506. BIDENS CORONATA (L.) Britton, var. BRACHYODONTA, var. nov.: FIG. 1, plant, × 2/5, from Chebacco Lake, Essex, Massachusetts, *Fernald, Hunnewell & Long*, no. 10,690; FIG. 2, outer (broad) and central (narrow) achenes, × 4, from the TYPE, Harwich, Massachusetts, *Fernald*, no. 17,613; FIG. 3, achenes, × 4, from Pilling Pond, Lynnfield, Massachusetts, October 21, 1917, *Fernald.*

Var. TYPICA: FIG. 4, outer (broad) and central (narrow) achenes, × 4, from Delaware River, "New Jersey, near Philada.," *A. Gray;* FIG. 5, achenes, × 4, from Peoria, Illinois, 1869, *Stewart.*

Var. TENUILOBA (Gray) Sherff: FIG. 6, outer (broader) and central achenes, × 4, from one of the original sheets, Peoria. Illinois, 1869, *Stewart;* FIG. 7, achenes, × 4, from Buffalo Lake, Montello, Wisconsin, *Fassett*, no. 8964.

Var. TRICHOSPERMA (Michx.) Fernald: FIG. 8, outer (broad) and central (narrow) achenes, × 4, from south of Swann Point, Virginia, *Fernald & Long* no. 6909; FIG. 9, achenes, × 4, from Satilla River near Woodbine, Georgia, *Harper*, no. 1562.

B. MITIS (Michx.) Sherff: FIG. 10, outer (broader) and central achenes, × 4, from Leavy County, Florida, November, 1877, *Garber.*

PLATE 507. BIDENS INFIRMA, sp. nov.: FIG. 1, portion of TYPE, × 1, from Anse St. Vallier, Quebec, *Fernald*, no. 2955; FIG. 2, head, × 2; FIG. 3, achenes (shortest marginal, longest central), × 4.

B. HETERODOXA (Fern.) Fern. & St. John: FIG. 4, achenes, × 4, from Southport, Prince Edward Island, *Fernald, Long & St. John*, no. 8205.

B. HETERODOXA, var. ORTHODOXA Fernald & St. John: FIG. 5, achene, × 4, from Alright Island, Magdalen Islands, *Fernald, Long & St. John*, no. 8204.

B. HETERODOXA, var. AGNOSTICA Fernald: FIG. 6, achene, × 4, from Pocotapaug Lake, Chatham, Connecticut, *Fassett*, no. 2369.

CYPERUS OXYLEPIS IN THE UNITED STATES AND MEXICO.—*Cyperus oxylepis* Nees is cited in the literature as occurring in the West Indies and South America. Apparently there are no records from the United States and Mexico. The following specimens are cited as probable records for this species.

Standley 879. "Island off Aransas Pass, Aransas Bay," Texas, May 24, 1922. *Brandegee.* Guaymas, Sonora, Mexico. University California Herbarium. Number 200,897. November 11, 1893. *Deam, Charles.* 104. Salina Cruz, Mexico, December 21, 1898. *Rose,*

Standley and Russell 13,861. Salt flats, Sinaloa, Mazatlan, Mexico. April 1, 1910.—Hugh O'Neill, Langlois Herbarium, Catholic University of America, Washington, D. C.

A New Variety of Polygonum from Washington.—Polygonum Newberryi Small, Bull. Torr. Club **21**: 170, 1894, occurs in the Cascade Mountains of Washington and Oregon and the Sierra Nevada of northern California; also it has been collected in the Olympics and in the Wenatchee Mountains of Washington. Its type-locality is Crater Pass, southern Oregon, where it was discovered by Dr. Newberry in 1856. Throughout most of the range of this species the plants are finely pubescent. However, specimens from the Olympics, and from the Wenatchee range, are uniformly glabrous. Dr. Small's original description included both pubescent and glabrous plants. Since the glabrous plants have a restricted geographical distribution and probably constitute a distinctive biotypic unit they are here proposed as:

Var. **glabrum**, var. n., planta tota glaberrima, caetera cum forma typica congruentia.

Specimens examined. Washington: Olympic Mountains: Seven Lakes Basin, *Jones* 8322 (type); Wenatchee Mountains: Mount Stuart region, *J. W. Thompson* 5830; Beverly Creek, Kittitas Co., *J. W. Thompson* 6846, 8760, 9597; Mountains, Washington Territory (without definite locality), *Brandegee* 1066.

These plants differ, *inter alia*, from *P. Davisiae* Brew. of California, by the petiolate, usually broader leaves.—George Neville Jones, Gray Herbarium, Harvard University.

Moss Flora of North America.—With the recent appearance of volume 1, part 2,[1] this work is now three-quarters completed. This latest section takes up the Dicranaceae (partly treated in part 1), Leucobryaceae, Polytrichaceae and Calymperaceae, and describes a total of 101 species. Most of these species are represented by figures, largely transcribed from other works but including original illustrations for 16 species by Dr. Seville Flowers and for 8 others by Dr. W. S. Steere. The genera treated are as follows: (Dicranaceae) *Angstroemia, Rhabdoweisia, Oreoweisia, Dichodontium, Oncophorus, Symblepharis, Dicranoweisia, Arctoa, Dicranum, Dicranodontium, Campylopus, Brothera* and *Paraleucobryum;* (Leucobryaceae) *Octoblepharum* and *Leucobryum;* (Polytrichaceae) *Atrichum, Oligotrichum, Lyellia, Polytrichadelphus, Pogonatum* and *Polytrichum;* (Calymperaceae) *Calymperes* and *Syrrhopodon.* One new variety is described and there are 8 new species-combinations and 12 new varietal combinations. The text for the Polytrichaceae is contributed

[1] Moss flora of North America, north of Mexico, by A. J. Grout. Vol. 1, part 2, pp. 63–135, pls. 39–68. August, 1937.

by Dr. T. C. Frye; for the Calymperaceae by Dr. Steere. For the Polytrichaceae attention should be called to several published extensions of range which Dr. Frye apparently has overlooked, as follows. *Pogonatum brachyphyllum* (Rich.) Beauv., northern limit given as New Jersey, has been recorded from Connecticut[1] and also collected by Latham in eastern Long Island (specimens in Yale herbarium); *Pogonatum capillare* (Rich.) Brid., eastern range given as "Greenland to Newfoundland and New York, southward to North Carolina," has been recorded from northern Michigan, where it grows along the south shore of Lake Superior.[2] *Pogonatum alpinum* (Hedw.) Roehl., described as ranging "southward to Newfoundland, New Hampshire, Vermont, New York . . . ," has been recorded from northwestern Connecticut.[3] Incidentally, while it is accredited to this State by Dr. Frye, the writer has been unable to locate any Connecticut specimens of *Polytrichum gracile* Sm.—G. E. NICHOLS.

[1] RHODORA **12**, p. 153. 1910.
[2] Bryologist **36**, p. 77. 1933.
[3] Connecticut Geol. & Nat. Hist. Surv. Bull. No. 11, p. 175. 1908.

Volume 40, no. 476, including pages 281–324 and plates 494–496, was issued 1 August, 1938.

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